

THE PSYCHOLOGICAL BULLETIN

COLOR NOMENCLATURE AND SPECIFICATION

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Judging by the attention that continues to be given to it, the question of naming colors is of greater importance and of wider significance than one might at first suppose. It is futile to argue as to the priority of any one of the various sets of premises from which the questions of color nomenclature and its necessary consequent, specification, have been approached. Much of the interest has grown, naturally, out of practical problems and difficulties, and often those problems have been attacked at that level without appeal to the laboratory. Psychology has been singularly unconcerned about color since the pronouncements of Hering. Not that it has neglected the field of vision, but it has been interested either in the physiological implications of the results or in their systematic significance. For physics, on the other hand, it is a short step from the study of light waves to the problems of color which psychology has neglected. Yet many of the practical problems of color remain unsolved, notably that of naming and specifying colors in a way that shall be intelligible and simple, but accurate.

In 1930 Maerz and Paul (43) published a *Dictionary of Color* which, besides being a dictionary, gives an orientation to the practical problems of color. For that reason it forms an excellent cornerstone for this review. We shall cite few articles of earlier date, and though we shall try to make the consideration of the past 7 years comprehensive, we shall select only such articles as add materially to the presentation of the problems of nomenclature and specification, or to their solution.

The book by Maerz and Paul deserves careful consideration. The authors have set themselves the task of defining color names according to usage, and their "Introduction" forms an illuminating presentation of the problems involved and the methods followed. They have followed physical specification methods and they have taken into account the effect of Weber's Law, but such considerations are only tools directed toward the careful designation of the color best representative of every color name of sufficiently general usage to warrant its inclusion. The 4 appendices include a list of terms other than color names used with reference to colors, a frequency table showing the use of names by American and British paint manufacturers, the list compiled by the Textile Color Card Association, a polyglot (5 languages) table of the principal color names, a brief history of the progress of our color names toward standardization, and a limited bibliography covering the period from 32 B.C. to 1928 A.D. While one notes the predominance of certain industrial interests, the "Dictionary" is not presenting a particular system of color designation. The scheme of arrangement is simply one of convenience for presenting a large number of color samples for comparison, and indicating the common name wherever usage justifies it. This is accomplished in a set of 56 color plates, 42 of which contain 144 samples each and 14 of which contain 72 samples. The swatches are graded from white or gray to various hues and from one hue to another, so that a wide range of colors is covered. Opposite every plate are indicated the color names of the various samples. It is surprising how small a proportion have separate designations. When one looks from plates of colors to lists of names he begins to appreciate the difficulties that confront an industry where color is an important item.

Among the standardized sets of colors designed particularly for the use of a given industry should be mentioned the standards of the Textile Color Card Association (65, 73). These consist basically of a "Standard Card" which contains 192 named color samples of two-surfaced silk ribbon. The names are number coded for easy communication. "Seasonal Cards" are issued at certain intervals to indicate seasonal trends in textile colors. There has been no attempt to be systematic in the compilation of the "Standard Card." A special utility is its sole aim. Though Maerz and Paul have incorporated many of its names in their "Dictionary" there are some which come under their criteria of fantastic and bizarre terminology, *e.g.* siesta, monsignor, quimper, pablo reseda, mummy, monkey skin. An organization, patterned upon the T.C.C.A. and functioning in

Great Britain, calls itself the British Color Council and has issued a *Dictionary of Color* (80) of 220 named standards. Such standards remind one of the familiar paint card, but it must be remembered that a standard card is issued by an industry rather than a single company and has a considerable influence on our color naming habits. Even the paint cards show improvement. One company (39) at least has standardized and coded 16 basic oxide pigments so that upwards of 400 enamel colors can be produced by following the prescribed formulae.

Two systems of nomenclature and specification that are not of recent origin must be mentioned because of the frequent references to them in the literature. These are the Munsell System (46) and the Ostwald System (21, 59). Both of them are based upon a casual and uncritical psychology influenced by certain physical considerations. Munsell proposes a theoretical color sphere which is subdivided vertically, horizontally, and radially. These dimensions are designated chroma, value, and hue, respectively. Each dimension contains, thus, several numbered or named steps of which samples are given in the *Book of Color*. While the scheme provides for 20 hues at 14 chromas and 9 'values,' a total of 2520 separate colors, the number is very much reduced by various factors, such as the limited number of chromas at the higher and lower value steps. Since the colored papers of the Munsell System are prepared with precision and are available outside the book and in various sizes, they have formed the basis of a number of experimental investigations. Godlove (14) pointed out some of the applications of the system in a paper before the O.S.A. and in a later paper (15) derived formulae for specifying colors by mixtures of standards from the Munsell set. Godlove and Munsell (16) have pursued the problem further and made a direct comparison between matches in the Munsell book and spectrophotometric analyses in which it appears that the quasi-psychological method compares well with the physical for purposes of stimulus specification. Nickerson (51, 52) has given an explication of the Munsell notation and its application to the grading of various products, together with the apparatus necessary to make such applications. In later experimental applications (53) she measured the deviations in various colored materials that may be accepted as matches; in another (54) she applied the tolerances determined in Munsell steps to the problem of fading of textiles.

The foregoing papers, with one or two exceptions, have appeared to take us away from the question of nomenclature toward that of

specification, and already there is indication that a "physical" specification has been sought. The Munsell System, however, is built upon the quasi-psychological hypothesis of 3 color attributes, hue, value, chroma, and is an attempt to substitute number symbols for names in all dimensions except hue, where the color names have been reduced to 4 plus their combinations. We have called the system "quasi-psychological" because, while it is founded upon psychological judgments of color likeness, and is usable only in that manner, it retains certain casual and pseudo-physical concepts which are not borne out by psychological observation, notably the 3 dimensions of color that are supposed to parallel the 3 aspects of the physical stimulus—wave-length, purity, and luminance. It is significant that work (23) is now in progress which, in effect, transmutes the number symbols into color names once more.

While some writers have been trying to refine a nomenclature into a specification of color, there are others whose problems have not led them so far. Sesame and Kido (69) point out that "names for colors [are] so few that we name intermediates by objects." A complete philological study of color names would be interesting. Undoubtedly, many of our color names have object origins, and here is the implication that the same is true in Japanese. An anonymous writer (74) suggests a list of color names (numbered to 75) for use in the theater. It is assumed that commercial gelatins will approximate satisfactorily the color intended by the name. Judd (32) has worked out a simple numerical translation of the physical specification of theater gelatins which should prove useful in that field. Anderson (3) has called attention to a convenient color chart that can be used for standards of color comparison in genetics (botany).

Critical consideration of the systematic naming of colors antedates anything that we have cited. Maerz and Paul (43) give a brief treatment of the historical aspect, and before them Ames (2) summarized and evaluated a number of current systems with the needs of the artist in mind. More recently in the limited field of signal lights Luckiesh and Moeller (40) made a test experiment on color naming with 38 subjects, among whom they found wide variations even though they were limited to the names of "the simple colors of the spectrum and combinations of these." The variations ran for one color from blue-green through blue to yellow-green and white, and for another from pale yellow through several oranges to red. While some such discrepancies may point to "abnormalities" of color vision as indicated by Katzin and Murray's (33) study, a

major factor is undoubtedly the training of the subjects. How a theoretical bias may function to alter the significance of color names is apparent in a protest by Birren (6) against the sample of "blue" which Ladd-Franklin (38) makes primary in her system and again (5) in his attempt to bring together the "primaries of physics, psychology and art."

The difficulties with the naming of colors demand their designation in a way that will eliminate the ambiguities. For many purposes the spectral analysis of the reflected or transmitted light answers. However, a certain minimum of terms cannot be dispensed with, and to unify and standardize the usage of such terms the Optical Society of America maintains a committee on color nomenclature and colorimetry which has reported from time to time (56, 57). The present committee (22) has its full report in preparation but has issued a preliminary draft defining a number of terms and indicating the course of its procedure.

An important event occurring in 1931 in the field of color specification was the establishment of standards of illumination and of certain conditions of observation by the International Commission on Illumination (20). Judd (25) has given us an excellent exposition of the standard coördinate system based upon the I.C.I. standards, together with the necessary information for their application. More recently Hardy (17) and his colleagues at Massachusetts Institute of Technology have compiled tables and charts to speed the calculation of trichromatic specification of colors and to assist in its interpretation. The system in question is based upon the familiar laws of color mixture and upon the mixture data obtained in the attempt to determine the 3 colors which will give the best set of spectral matches. The standards of reference obtained from this data are the culmination of a long series of researches, which is recorded in the literature of physical optics. To attempt to trace that development would be outside the scope of this review. However, several excellent experimental papers, incidentally showing stages in its course, have been written by Judd (24-29). It would be impossible, also, to summarize the later work of Judd (25) and of Hardy *et al.* (17), since their essential values lie in their formulae, tables, and graphs for tricoördinate specifications.

The importance of tricoördinate specification in colorimetry is evidenced by the many applications that have been reported and by the explanations of its uses that have appeared in various trade journals. Two excellent expositions for the layman have been made

recently by K. S. Gibson (12, 13) and a more technical summary of the subject has been issued as a *Letter Circular* from the National Bureau of Standards (50). The Institute of Paper Chemistry (60) presents the same information for a special group of readers. Such general presentations of the subject do not attempt, naturally, to summarize the technical methods of Hardy's book or Judd's articles, but to show the theoretical and experimental background of that work and to point out its practical applications in industry.

Specific applications have been numerous and varied, and can only be sampled here. Judd (30) and MacAdam (42) have determined the whiteness of paper, cloth, etc., with reference to magnesium oxide as a standard (47). MacAdam points out that the specification is merely an extension of the specification of colors in general. Judd's second paper is of considerable general and methodological interest. He calculates the colorimetric specifications of 30 samples of "white" paper and of MgO. This gives him a rank order of degree of whiteness in physical terms. He then presents the "white" papers to 15 observers who grade them by inspection with respect to "whiteness." He has, thus, the basis for comparison between the 2 methods and he finds that such comparison justifies the use of MgO as the basic standard of whiteness. As one would expect, individual differences appear among the observers who rated the whiteness of the papers, but instead of giving a mere scatter of judgments these differences classify the observers into 2 groups. The members of group 1 correlate as closely with the computed arrangement as with the average arrangement of the group itself. The judgments of the members of group 2 correlate significantly better with their own average than with the computed arrangement. This difference between groups of observers indicates the presence of uncontrolled factors in the judgmental problem set for the observer. The experiment is not a mere statistical canvass of naïve responses, because the observers were trained in making such judgments. Consequently the bimodal distribution of results indicates a stability of judgment for individual observers, which is cut across by an inadequately defined standard of judgmental reference. Judd has been interested in bringing out this fact since his problem included the establishment of a standard as well as a test of the methods of comparison current in the paper industry.

In some fields, such as the manufacture of paint, purely physical spectrophotometric standards are maintained. The American Society for Testing Materials (1) describes such a standard and the full

procedure for determining the color characteristics of a paint. The National Bureau of Standards has issued a *Letter Circular* (49) summarizing methods and literature in the field. Rupert (66) reports a study of the spectrophotometric characteristics of pigments and their mixtures, which was directed toward a determination of the smallest number of pigments that would give a desired range of colors by mixture. Since this is a technological field the problem is limited accordingly and the terminology is somewhat special; for example, black and white are not "primaries" and we are introduced to "secondary" colors and "plus" and "minus" colors.

That there is not unanimity with respect to the best method of comparing colors to a standard is exemplified by 2 studies from the dyestuff industry. Draves (9) maintains that direct visual examination by master dyers has many advantages over spectrophotometric analysis. In the case of one particular dye, he cites evidences which indicate that differences can be detected by eye that are too small to be found with the spectrophotometer. Nutting (55) points out that Draves has misinterpreted his spectrophotometric curves which actually did differ significantly, though not in the region of the dominant wave-lengths of the colors that were compared. Nutting establishes the fact that in the case in question the spectrophotometer is as sensitive or slightly more so than the eye, but Draves' other points hold, and though the curves tell of a difference between 2 colors, they do not indicate the appearance of that spectral difference.

The problem of retinal function is scarcely concerned with the matter of naming or of precisely designating colors, though Hecht (18, 19) appears to be paralleling closely the system of trichromatic specification, and Ladd-Franklin (38) emphasizes again the psychological primariness of certain colors.

The psychological interest in the subject of this review has been much less concerted and urgent than that of physics or of general practice and industry. Perhaps this is because psychology has been concerned with more human and social problems. Nevertheless, important contributions have been made from time to time, and it is becoming apparent that the physical approach is only partially adequate to problems of color. After all, instruments never see, yet it is the appearance of a color that is finally of interest.

Troland (75) brought together most of the important material on the subject of color and made a thoroughgoing attempt to systematize it, yet so far as our problem is concerned, he was influenced too largely by the physical aspects of the stimulus. He repudiated

the psychological observations and systematizations of Höfler, Ebbinghaus, Titchener, Stumpf, and Müller in his arrangement of colors into circle, cylinder, and cone. This is partly because he adhered to the traditional 3 attributes of color and made no attempt to follow out his own observation that the "space of the color system does not necessarily have the same mathematical properties as does geometrical or physical space. In other words it may not be Euclidean." Dimmick (7) had already pointed out this possibility and had shown that the relations of the color solid require a four-dimensional interpretation. It is interesting to note that the regular form of the color pyramid is similar to some of the models used by mathematicians to demonstrate the representation of 4 dimensions in three-dimensional space, just as one draws a picture of 3 dimensions on a flat surface. Since the naming and specifying of colors from a psychological point of view is closely bound up with their schematic representation, the interpretation of the color solid is important for our subject. It is usually obvious what a writer's bias is from the way in which he draws that figure. Dimmick and Holt (8) offer experimental evidence of the validity of the four-dimensional hypothesis in a series of determinations which indicate that the choice of what they call the 7 "unique" colors, viz., red, yellow, green, blue, black, gray, and white, is not merely a matter of theoretical systematization. Their observers found the 7 unique colors both necessary and sufficient. The implications of this result are important for naming and specifying colors.

Weissenborn (78) presents an interesting series of 9 color figures dating back to 1772, each one of which offers a somewhat distinct system of color designation. The particular series culminates, however, in that of Kirschmann (35) and is simply of historical interest. Among the color schemas that have been offered is a "Farbenschraube" by Barthel (4). Its implications are more important for certain artistic interpretations of color than for color nomenclature. Podesta (61) has discussed in detail various aspects of the color solid and arrived at "eines vertikalen Doppelkegels mit schräggestehender elliptischer Grundfläche," which he holds will represent separately "der Farbtenqualität, der Helligkeit und der Reinheit." This obviously is only a minor deviation from the classical figures and carries no implications for naming or specifying colors. Rusk (67) has outlined a triangular schema for designating colors by reference to black, white, and a hue. He proposes arbitrary units or steps which are to be determined "physically" but his plan does not

include any specification of hue. Schouten (68) has proposed a four-color theory on a quantitative basis which he carries through to a parallel physiological hypothesis. His 4 "Grundfarben" are the familiar red, yellow, green, and blue chosen partly on the basis of a crude statistical determination of the psychologically pure colors, but the system is still only a variation of the mixture diagram since it deals primarily with the spectrum in a plane surface and is not expanded along the white, gray-black axis. Sinden (71) attempts to correct this deficiency in the mixture triangle by projecting it into 3 dimensions along a group of lines radiating from "white" as a point of origin. Silberstein (70) has made an exhaustive mathematical analysis of the threefold representation of colors. It makes the assumption of tridimensionality to begin with and does not lead us, therefore, to any new observations that bear upon the problem of nomenclature. In a *Letter Circular*, Judd (48) summarizes the attempts to establish the several spectral points of hue reference. He reports only 2 recent attempts, both of which rely upon statistical compilations. Weld (79) obtains the judgments of 38 casual observers as to the location of the boundaries between red and orange, orange and yellow, etc. We can scarcely hope that such an investigation will do more than emphasize individual variability in designating colors. Verbeek and Bozen (77) reported the judgments of 100 observers who were restricted in their judgments to red, orange, yellow, green, blue, and gray, but the problem is obviously one that cannot be settled so casually.

There are a number of experiments which should be mentioned, though their bearing on our problem is only indirect. Klughart (36) has worked out a series of grays carefully graded so that the stimulus changes by constant logarithmic increments of luminance. Klughart and Richter (37) have made similar determinations of series of equal saturation and compared them with the theoretical and observed values of 10 other writers. Ehrenberg (10) outlines a scheme of numerical designation for colors that is related to Ostwald's and Goethe's color circles, and offers a brief example of its validity. Richter (64) gives careful consideration to the technique of psychophysical investigation in colorimetry and the application of the $\Phi(\gamma)$ hypothesis. Purdy (62, 63) makes a partial determination of the "invariable hues" which are identified with the "psychological primaries" and thus contributes to the problem of specification. He also discusses the distinction between "chromatic" and "achromatic" colors, or between colors and non-colors, and brings out the

point that brilliance and chroma are not mere "additive components" of vision. Whether this means that "one must apparently conceive of some sort of 'form quality' which shall indicate chroma" is debatable. Purdy's argument is based largely upon physiological considerations and abnormal cases, but he is in agreement with the purely experiential observations (7, 8) that brilliance and chroma are both qualitative aspects rather than quantitative. Gray may be "a sort of 'dead level,'" as Purdy states, but of a physiological sort, certainly not a qualitative, by his own argument. An abnormal case reported by Turner and DeSilva (76) bears directly upon this point for it appears that the subject in question, although totally color-blind in the ordinary sense, was able to distinguish colors from grays, and saw black as the "brightest," "strongest," and "most intense" of all his colors. Black is still an interesting phenomenon because of its anomalous correlation with a "zero" physical stimulus. Luh (41) objects again to the Ladd-Franklin explanation and points out the confusion between observation of the quality 'black' and the physical possibilities of the stimulus. Mintz (45) directed an experimental study against the perceptual character of black maintained by Fiedler (11) but for some reason, not evident in his paper, he is unwilling to conclude "that experiences of black and white are of the same kind as the experiences of colors," even though he states: "By using his methods [Fiedler's] one cannot find any significant difference between these groups of phenomena." Green and brown (34, 58) also have been subject to special study because of their peculiar relation to the darkening of a yellow stimulus. Matthaai (44) has raised the question of the reconsideration of the attributes of color as contrasted to the qualities. He understands under "Attribut der Farben," ein mehr abgeleitetes, relativ sekundäres Merkmal: es ist für mich das neben der Qualität Mitgegebene." Though he does not carry it through in that fashion, his thesis suggests that color specification must eventually go beyond the qualities of color into the perceptual aspects. There are hints of this in the literature, but there is nothing yet that is specifically applicable.

We may summarize the present status of color nomenclature and specification as one in which there is a considerable interest and activity generated by practical problems in art and industry, but it is significant that these problems have not altered materially from the time Ames (2) stated them. Physical specification of color stimuli that refer finally to spectral wave-length is now highly perfected, but

though the current specification, viz., trichromatic coördinates, is based upon certain psychological observations the technique of dealing with observers remains at a crude level. Physicists in general are not aware that an observer who is dealt with according to the technique of the psychological laboratory may be as reliable as any of his own instruments, though there is plenty of indication of this fact in the literature. On the other hand, psychologists have begun to show an increasing interest in the physicist's side of color specification. Largely under the influence of Troland, they have adopted the accurate methods of physics for specifying stimulus conditions and there is some evidence that the importance of the observer and of control of observational conditions is being appreciated.

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PROCEEDINGS OF THE THIRTY-THIRD ANNUAL
MEETING OF THE SOUTHERN SOCIETY FOR
PHILOSOPHY AND PSYCHOLOGY

FRANK A. GELDARD, SECRETARY, UNIVERSITY OF VIRGINIA

The Thirty-third Annual Meeting of the Southern Society for Philosophy and Psychology was held in Knoxville, Tennessee, on April 15 and 16, 1938. The host institution was the University of Tennessee; Hotel Andrew Johnson was headquarters for the Society. The Friday sessions and the Saturday afternoon sessions were held in the hotel; the Saturday morning combined session and business meeting was held in Dabney Hall of the University. Fifty-four papers were read, 36 being in psychology, 18 in philosophy.

The Council of the Society met Thursday, April 14, at 8:00 P.M., at the Andrew Johnson, President Marten ten Hoor presiding. Other Council members present were: E. S. Dexter, F. A. Geldard, M. S. Harris, C. P. Heinlein, L. H. Lanier, F. Marti, J. P. Nafe, and H. C. Sanborn.

The annual banquet took place at the Andrew Johnson on Friday evening, April 15. An address of welcome was made by President James D. Hoskins of the University of Tennessee. Following the banquet the presidential address, *The Philistines over Philosophy!*, was delivered by Dr. Marten ten Hoor.

The annual business meeting of the Society convened at 11:30 A.M. on Saturday, April 16, President ten Hoor presiding.

MINUTES OF THE ANNUAL BUSINESS MEETING

The minutes of the Thirty-second Annual Meeting, published in the *PSYCHOLOGICAL BULLETIN*, Vol. 34, No. 8, October, 1937, were approved as printed.

The annual report of the Secretary was read and approved. It contained an analysis of membership, which revealed a net loss of 11 members during the year. Five members had resigned in good standing, 9 had been dropped for nonpayment of dues, and 2 (R. P. Halleck and J. B. Hathorn) had been lost through death. Five members had been added since the last meeting, their election having been automatic by virtue of their affiliation with the American Psychological Association: M. E. Carver, University of Richmond;

C. H. Crudden, Milligan College; J. P. Shea, U. S. Forest Service; K. W. Spence, University of Virginia; and J. B. Wolfe, University of Mississippi. The present membership stands at 214. The report also included a statement of the work of the Program Committee in selecting the papers for the Knoxville meeting and, at the instance of the Council, asked for instructions from the meeting concerning future policy in the arrangement of the program. On motion of Professor Miner it was voted to approve double sections on the program whenever necessary to include all papers of high quality.

The report of the Treasurer was read and accepted. Assets and receipts totaled \$998.01, expenses \$122.93, leaving a cash balance at the end of the fiscal year, April 9, 1938, of \$875.08. This represents a net gain during the year of \$178.47, the cash balance on March 20, 1937, having been \$696.61.

There were no formal committee reports but Professors Nafe and Miner made informal reports for the Committee on the First Course in Psychology. On recommendation of the Council it was voted to withdraw the Society's representation on the so-called "Committee of Fifteen," a joint committee with the Midwestern Psychological Association.

The chair announced the personnel of the 2 standing committees authorized at the last meeting. The Committee on Philosophy consists of: A. Brett, A. G. Widgery, and A. G. A. Balz, Chairman. The Committee on Psychology consists of: J. F. Dashiell, C. P. Heinlein, and J. P. Nafe, Chairman.

A recommendation of the Council to continue the publication and distribution of the Handbook containing the Constitution and Membership List was adopted on motion of Professor Balz.

The following Council recommendations were approved by the meeting:

1. That Article II, Section 2, of the Constitution be amended as follows: "Any former member who seeks reinstatement must make application to the Council. If such a former member was dropped for nonpayment of dues he will be required upon re-election to pay such dues as he was in arrears at the time when he was dropped from the Society."
2. That the arrangement of the program for the annual meeting, as far as philosophy papers are concerned, be assigned to the Standing Committee on Philosophy.
3. That the Standing Committee on Philosophy be authorized to approach administrative officers of institutions with a view to furthering teaching and research in the field of philosophy.
4. That the Standing Committee on Philosophy be authorized to invite those

properly qualified in the field of philosophy to apply for membership in the Society.

5. That the Standing Committee on Philosophy be authorized to borrow such part or parts of Dean M. T. McClure's collection of statements on the function and need of the teaching of philosophy as it may deem useful for distribution to southern institutions.

6. That the Standing Committee on Philosophy be authorized to make an expenditure of not over \$50.00 for the purposes described in recommendations 2, 3, 4, and 5 above.

7. That the President be instructed to appoint, sometime previous to the annual business meeting, a Committee on Resolutions.

8. That the President be authorized to appoint, sometime previous to the annual business meeting, a committee whose duty it shall be to prepare and present, whenever the occasion arises, appropriate resolutions in connection with the death of a member or guest of the Society.

On recommendation of the Council, the following new members were elected: R. A. Gardner, University of Kentucky; M. B. Mallett, University of Virginia; J. G. Pratt, Duke University; C. T. Ruddick, University of Virginia; and C. E. Stuart, Duke University. The following were reinstated as members: E. J. Asher, University of Kentucky; and R. E. Dunford, University of Tennessee.

On recommendation of the Council, the following were elected: President: Frank A. Geldard, University of Virginia; Secretary-Treasurer: C. Paul Heinlein, Florida State College for Women; Council Members: Emily S. Dexter (1938-1941), James B. Miner (1938-1939), and Herbert C. Sanborn (1938-1941).

A motion was made by Dr. W. P. Chase to amend Article III, Section 2, of the Constitution to read: "Vacancies in all offices shall be filled at the annual meeting of the Society upon nominations made by the Council and by the members of the Society at its annual meeting." Under the amendment provision of the Constitution the proposed amendment was tabled for action at the next annual meeting of the Society.

A Council recommendation to accept the joint invitation of Duke University and the University of North Carolina for the 1939 meeting was approved.

On motion of Professor Widgery the President was instructed to write a letter of condolence to Frau Dr. Stern, expressing the regret of the Society on the passing of Professor William Stern.

A resolution of appreciation to the local committee, the University of Tennessee, and the City of Knoxville for their cordial hospitality, moved by Professor Balz, was responded to with a rising vote. The meeting was adjourned at 1:00 P.M.

PROGRAM

FRIDAY MORNING SESSION, APRIL 15

PHILOSOPHY

CHAIRMAN, LEWIS M. HAMMOND

Aesthetics and Epistemology. HAROLD N. LEE, Sophie Newcomb College, New Orleans, La.

Aesthetics is the theory of perceptual intuition. Croce defines intuition as immediate knowledge whereas logical knowledge is mediated by concepts. Concepts are universal. Perceptual intuitions are particular. Knowledge, however, involves universals. Hence, intuition is not knowledge, but is the stuff from which knowledge is made. The conceptual element in knowledge is not intuited. Where, then, does it come from? The Platonic, Aristotelian, and mediaeval answers hold that the universal is a reality and is given to the mind by some process analogous to intuition. Kant held that the universal is *a priori*: given in the structure of the mind. The present paper holds that the universal is not given at all, but that the mind constructs it. Aesthetic objects are generalized and these generalizations are the conceptual element in knowledge. It is unnecessary to allocate any substantial reality to them. The process of generalization does not require any literally common element between particulars. The mind merely fails to discriminate between different objects for certain respects and purposes. Generalizations are not dependent alone upon either the nature of the intuitions or the nature of the mind. Of all possible generalizations, the mind keeps those that fit into a categorical scheme and discards the rest. The applicability of this categorical scheme to the understanding of the world does not depend on the assumption of any substantial reality in the universal.

The Thomistic Doctrine of the Unity of Creation. LEONARD J. ESLICK, University of Virginia, Charlottesville, Va.

In creation there is formal inequality and material multiplicity. Creatures partake of unity and being only imperfectly, and after a defective similitude. By virtue of their division from each other, which is the aspect of relative nonbeing in the world, they are sheerly *other*. But otherness and inequality are unintelligible as such. Knowledge requires formal sameness and equivalence. In God's understanding, creatures are known by the comparison of the divine

essence, which is subsisting being itself, with creatures as particular modes of participating in being. The divine essence, as excelling all creatures, can be taken as the proper ratio of each thing according to the diverse ways in which creatures participate in and imitate it. But we cannot achieve Ideas of things which represent the true equality of proportion which is in them, since the condition of such knowledge would be perfect understanding of the divine essence. We do not possess the only *measure* which is the absolute standard of truth. But we do possess, through abstraction, measures or elements of order which are *relative*, but not sophistic. That which exists in nature is a definite dimensionality which we call body in union with a determinate form, and it is this union alone which is real. We may know it only obliquely, through division and composition of logical entities. Through abstraction from the material, corporeal principles of things we achieve mathematical and physical elements of order. Formal abstraction gives us species and genus. But these abstract entities must not be reified. There is no real unity of the species in nature, but only in the consideration of our intellect. Species gives us ideal formal unity and undivision. The mathematical give us ideal material unity and undivision. These logical entities provide *adequate* knowledge of nature. Indeed, human sciences, because they are concerned with ideal essences, with ideal quantity, quality, etc., achieve the formulation of universal law.

Essence and the Concept of Class. KENNETH K. BERRY, University of Virginia, Charlottesville, Va.

It is the thesis of this paper that (1) the logic of classes proceeds upon the tacit assumption that logic is a science of pure form and that (2) logic is not and cannot be such a science for man. The essences of composite substances include the matter as well as the form. It follows that, in all human judgments, there is necessarily involved material as well as formal implication. There are, however, 2 exceptions. One is at the level of a transcendental logic; but this purely formal logic is not of the same order as that which must be the tool of natural science and common sense. The second exception is in the case of mathematics; for though derived by abstraction from the essences of composite substances, mathematical entities may be treated as a kind of artificial immaterial essences. The concept of *class*, it is held here, is obtained by the intellect in observing the natural classifications of the genus-species hierarchy and the categories. But it is then "dematerialized," made purely formal like

the mathematical essence, and used to cut across the actual structure of being. To operate thus with the concept of class is to say that man imposes upon the world such forms as he may wish—remaking it at will.

Knowledge and Reality. LOUIS O. KATTSOFF, University of North Carolina, Chapel Hill, N. C.

Any scientific system consists of a body of propositions which states relations between 2 or more concepts or terms. These terms correspond to definite objects or characteristics in the objective field of the relations. The proposition, therefore, corresponds to some state of affairs in the objective field of the science. The relations between the propositions are also seen to correspond to relations between states of affairs. These facts demonstrate that for science to be possible at all, the objective field of the science must constitute a system analogous to an implicative system. This means that nature is ordered in a rational fashion and hence can be explored by Reason. The dualism of knowledge and reality is bridged by the occurrence in both of a common element; namely, rational principles.

Logical Positivism: A Philosophical Tradition Perpetuated. GEORGE T. KALIF, New Orleans, La.

Despite differences in philosophic terminology, there is a fundamental identity between positivistic and traditional philosophical thought. Schlick's assertion that clarification of meaning in terms of verification is prior to any theory is itself close to, if not identical with, the classic doctrine of innate ideas. Schlick, like Descartes, finds a basis of certainty, not *in medias res*, but *ab initio*. Carnap, like Schlick, finds a basis of certainty in the completely free intellectual approach to the factual sentences of science, attaining complete objectivity affirmatively in the assertion of the validity of the scientific method, negatively in denying to expression any theoretic content. This same certainty has been the ideal of the traditional philosophers, and while they found it in some metaphysical absolute, the Positivists find it in the scientific method. With all their emphasis on the scientific method, the Positivists are, like the traditional philosophers, subject to the baggage of emotionalism, since with their vigorous defense of the scientific method in philosophy, categorically denying or affirming even with regard to matters of fact, they forget to put into practice the scientific spirit. Thus, if there are metaphysical cults, there is also the positivistic cult.

Experienced and Conceptual Continuity. RALPH A. GARDNER,
University of Kentucky, Lexington, Ky.

Intuitionists seem obsessed with the notion that continuity as experienced is different from conceptual continuity. They hold that continuity characterizes a whole, and that no sharply differentiated elements can appear in that which is continuous. Analysis destroys continuity, according to that position, for analysis isolates and studies elements. This notion is derived from the experienced difficulty of grasping an abstract property from a conceptual explanation. This paper defends the thesis that analysis is the only means of truly understanding continuity. It admits (indeed maintains), however, that true exemplifications of continuity are recognized by those who make no attempt to analyze, just as an instance of a doubly general proposition (for example) can be recognized by one who never analyzes and, hence, never understands its double generality. The nature of continuity is susceptible of analysis, and conceptual language is adequate for its expression.

PSYCHOLOGY

SECTION I

CHAIRMAN, KNIGHT DUNLAP

A Proposed Synthesis of the Facts and Theories of Color Vision.
WILTON P. CHASE, Woman's College, University of North
Carolina, Greensboro, N. C.

A synthesis of the facts concerning color vision can be made if it is assumed that the rods and cones of the retina are primarily sense organs for brightness vision and the cones secondarily sense organs for color. This view follows consistently from the facts of (1) intensity discrimination, (2) visual acuity and illumination, (3) scotopic and photopic visibility, (4) colorimetric purity, (5) the photochromatic interval, and (6) color mixture in the spectrum of a standard white light. Consideration of the cones as secondarily color receptors is supported by the data of color mixture and color-blindness which are best explained on the basis of 3 types of cones. Color vision, including white, can be considered in terms of the type and number of cones reacting. Colors can be mixed binocularly only when corresponding areas of the retinae are stimulated, demonstrating that color phenomena can be related to the afferent arc. Taking the viewpoint expressed above, it is possible to reconcile the various well-

known color theories, excepting the divergent ideas of the photochemical process. Hecht's concept of the population distribution of the thresholds of the sensory endings in the retina is absolutely essential to establish the proposed synthesis.

A New Chronoscope. R. E. DUNFORD, University of Tennessee, Knoxville, Tenn.

The new chronoscope herein described makes possible the obtaining of the reaction times of 9 subjects simultaneously or 9 successive reactions for a single subject. The instrument is of sturdy construction, suitable for demonstration and student use. The chronoscope is powered by an air-cooled synchronous motor (110 v., A.C., 60 cycles). The motor turns a shaft on which there are 10 pointers and a graduated wheel. In operation all pointers are at rest until released by electrically operated catches (8 v., D.C.). Release permits the pointers to rotate with the shaft. Released by successive impulses, S and R, the separation of the pointers is converted into time by the use of a vernier scale on the graduated wheel reading to .001 second. Fixed indexes for each pointer are so adjusted that simultaneous release of 2 or more pointers by the same electrical impulse will bring coincidence of all pointers released on their respective indexes. Thus the instrument provides its own immediate test for operational errors other than variation in current frequency. (The instrument was designed and built under the direction of Dr. K. L. Hertel of the physics department of the University of Tennessee.)

The Transmission of Vibratory Disturbances by the Skin. JOSEPH WEITZ, University of Virginia, Charlottesville, Va.

Using the apparatus described by Geldard and Gilmer, vibratory thresholds were taken of a number of "spots" on the dorsal side of the arm just above the wrist. This region was then cocainized by an electroosmotic process. With the aid of photographic maps of the areas and a binocular microscope, the original "spots" were retested for vibratory sensitivity. It was found that there was an average rise in threshold from 30 m μ in the normal skin to 330 m μ in the anesthetic region. On recovery with the return of contact and pressure there was a sharp drop in the stimulus limen of vibration. Using the same procedure but substituting procaine, it was found that the thresholds again rose. On recovery, prick returned first,

but it was unaccompanied by a change in vibratory thresholds. With the return of contact, however, there was a marked drop. Hence a relationship is assumed between the pressure sense and vibratory sensibility. The extent of the disturbances in the skin, as caused by the vibrating stimulus, was determined by means of a piezoelectric pickup. With this device it was found that the vibratory disturbances travel along the skin comparatively great distances. It was further found that the transmission was greatly enhanced by stretching the skin area stimulated. Although no sensation was elicited with the vibrating needle in the anesthetic zone, there were reports of vibration when the pickup needle was placed in the normal area on a "spot" responding to contact or pressure. This was assumed as further evidence of the relationship between vibration and pressure.

A Nonphotographic Method of Measuring Reflex Latency. LYLE H. LANIER, Vanderbilt University, Nashville, Tenn.

The precise measurement of reflex latency has usually been accomplished by means of some type of photographic technique. Dodge's pendulum photochronograph, and the photographing of oscillograph records of amplified action potentials are examples of this general method. But photographic procedure is both inconvenient and expensive, and a method of measuring reflex latency by means of a chronoscope seems highly desirable. Most chronoscopes, however, cannot be used to measure the speed of the faster somatic reflexes, due to the fairly large constant and variable errors attendant upon their operations. The Jasper-Andrews vacuum tube chronometer, which is subject only to a slight percentage error, would seem to be a suitable instrument for measuring reflex latency. The adaptation of the chronometer to the measurement of blink reflex time is described. In general, 2 polarized relays are inserted into the bridge circuit as stimulus and response switches. Closing the stimulus (induction shock) circuit through the first relay breaks the bridge circuit, causing a charge to flow on to a condenser. Amplified action potential changes from the responding muscles will move the armature of the second relay, thus breaking the bridge circuit again. A vacuum tube voltmeter measures the potential difference existing across the condenser plates. The amount of charge is a function of the time between the first and the second breaks in the bridge circuit. Calibration of the meter readings is accomplished by means of a gravity timer.

The Effect of Foveal Stimulation on Peripheral Sensitivity. S. RAINS WALLACE, JR., Tulane University, New Orleans, La.

All recent investigations of the interactional process in the retina have indicated that the sensitivity of the fovea is enhanced by a second foveal or peripheral stimulus, and that peripheral sensitivity is increased by the introduction of another peripheral stimulus. Inhibition is found only when the brightness of the inducing field exceeds that of the test patch by a gross amount. Despite the fact that no direct study of the effect of foveal stimulation upon peripheral sensitivity has been made, we should predict that it would be facilitatory in nature, since there seems to be no reason for assuming that the synaptic layers operate any differently for interaction in one direction than in another. However, there is an obvious attraction from a teleological viewpoint in the concept that foveal stimulation will produce inhibition of the periphery, and some writers have assumed this to be the case. This paper is a report of an experiment in which the differential threshold of the periphery was determined under 5 conditions of foveal stimulation. It was discovered that the sensitivity of the periphery is enhanced by a foveal stimulus, unless the latter is much brighter than the peripheral stimulus. It is concluded, therefore, that the same principles of interaction are operative throughout the retina.

Adaptation. JOHN PAUL NAFE, Washington University, St. Louis, Mo.

Adaptation is conceived as related to changes in the nonnervous parts of the end-organ rather than as a function of nerve. If movement is the only adequate stimulus for afferent end-organ excitation, adaptation means the cessation of movement or a dropping below the minimal rate of change essential to excitation. Preliminary experiments tend to confirm this view for somesthetic sensitivity. Extension of the principle to the special senses would modify our views of the problems in these fields in a fundamentally important manner.

The Measurement of Corneal Reaction Times. WILLIAM S. VERPLANCK, JR., University of Virginia, Charlottesville, Va.

The unique structure of the cornea makes it once again available as the locus for a critical experiment in cutaneous sensitivity. In the work reported, an attempt is being made to check the vascular theory of temperature sensitivity by the measurement of reaction times to cold stimulation (1) at the corneoscleral boundary,

(2) .75 mm. central from this border, and (3) 1.50 mm. in. If the vascular theory is correct, there should be an increase in the latency of the sensation as the stimulus is applied more centrally. If the Von Frey theory is correct, there should be no reliable difference. The apparatus used is described, and certain preliminary results are reported: there are indications that sensations of cold may be elicited more centrally on the cornea than has ever been previously reported.

SECTION II

CHAIRMAN C. P. HEINLEIN

Patterned Response Sectioning Technique. HENRY F. DICKENSON, Lincoln Memorial University, Harrogate, Tenn.

The problem was to produce a more economical and practical sectioning technique without the necessity of producing equivalent forms in content. Six hundred and forty-one subjects of the education classes of Lincoln Memorial University were used for this experiment. (These subjects represented about 20 States.) A total of 93,642 control and experimental responses were used in the study. Quantitative statistical comparisons were made for the equated groups. Coefficients of correlation were worked out to show the relationship between the control and experimental groups with Intelligence Tests, Standardized High School Achievement Tests, High School Grades, Professional Education Tests, and First Quarter University Grades. There is no statistical difference between these groups when only a single variable is in operation.

An Analysis of Factors Contributing to English Scholarship at the College Level. E. J. ASHER, University of Kentucky, Lexington, Ky.

The relative importance of the following factors in determining the English grades of college freshmen under 2 different instructors was determined by means of a partial correlation technique: (1) intelligence, (2) knowledge of English fundamentals at the beginning of the college course, (3) knowledge of English fundamentals at the end of the course, (4) improvement in knowledge of English fundamentals, (5) time spent in study. The partial regression equations involving these 5 variables with English grades as the criterion variable for 2 different instructors are compared (1) to illustrate a

statistical technique for determining the ingredients of a measure of success in a college course, and (2) to show the variation in importance of certain factors from one instructor to another in the same college subject.

Personality Traits Related to Conservatism and Radicalism. EMILY S. DEXTER, Agnes Scott College, Decatur, Ga.

In an effort to throw light on the question: "In what ways does the conservative person differ from the radical?" a variety of tests, including, among others, the Lentz C-R Opinionnaire, the Bernreuter Personality Inventory, and the Henmon-Nelson Test of Mental Ability, was given to about 150 college students. Additional data, such as the size of the family of which the subject was a member and the size of the home town, were also obtained. The most pronounced differences discovered had to do with amount of general information possessed, the degree of self-sufficiency and of introversion, the speed of movement and of decision, and the size of the town in which most of the subject's life had been spent. Degree of emotional stability, size of family, and income seemed to have no bearing on the question.

Musical Discrimination in Musically Trained and Untrained Subjects. EUGENE G. BUGG, Vanderbilt University, Nashville, Tenn.

This study compares the responses of musically trained subjects with those of untrained subjects under conditions calling for judgments of preference and for judgments as to basis of preference with respect to paired musical versions. The judgments were secured by means of the Oregon Musical Discrimination Test which was presented twice to 20 musically trained and to 20 untrained subjects. The trained subjects tended to be the more "accurate" (in terms of gross scores) and the more consistent in their discriminations. Both groups showed improvement upon repetition of the test, the untrained subjects exhibiting the greater gain. The outstanding difference between the 2 groups is the fact that the musically trained subjects were considerably more adept in determining whether the difference between the 2 versions of any combination was one of melody, rhythm, or harmony. The greater improvement shown by the untrained subjects on the second presentation of the paired versions was chiefly the result of improvement as regards the selection of such criteria. This study suggests that the differences in "musical discriminability" between musically trained and untrained subjects are

partly due to the factor termed "musical instruction." A method is suggested for testing this conclusion.

A Study of Estimates of Difficulty of Objective Test Questions.

THELMA HUNT, George Washington University, Washington, D. C.

A study of the accuracy with which difficulty of objective test items can be estimated by those constructing the items and by others qualified in the technique of test construction. The analysis is based upon the study of 175 alternate choice items, 51 completion or one-word-answer items, and 40 multiple choice items covering the subject-matter of an elementary psychology course. Actual difficulties of the items are determined by the answers of 150 students who answered the items as a part of a final examination. These are compared with estimates by the instructor of the course, with estimates by other instructors in psychology, and with estimates of a group of graduate students recently trained in test construction principles and techniques. Comparisons are made between different types of items; certain causal factors in errors of estimate of difficulty are pointed out; and the importance of the study in relation to problems of test construction and test duplication is discussed.

The Discrimination of a College Group Showing Reading Deficiency.

J. B. MINER and JAMES W. CURTIS, University of Kentucky, Lexington, Ky.

So far as college students are concerned the remedial reading problem has received little attention. So few adequately controlled studies have been made for college groups that we do not know whether negative effects of remedial training have been due to the method of selection of the group for special training or to inadequate methods of training. The first effort should be directed to those students who have obvious learning capacity on a nonverbal intelligence test, but do not read as well as their capacity would anticipate. Because of the close correlation between reading and verbal intelligence tests, the common use of a reading test alone is inadequate for discrimination. The tests used in this study were the Revised Beta Examination and the Iowa Silent Reading Test. Correlation scatter diagrams are shown to indicate the discrimination of half of the group whose sigma scores were relatively higher on the Beta than on the reading test. A group of 70 probation students is being used, with

suitable controls, for an experiment in motivation and suggestions for remedial reading.

Testing Cotton Mill Supervisors. WILLARD HARRELL, University of Illinois, Urbana, Ill.

The Bernreuter Personality Inventory, the Otis Self-Administering Test of Mental Ability, and Moss's Social Intelligence Test were given to supervisors in 3 Georgia cotton mill organizations. Ratings by superiors on a five-division descriptive phrase scale were available for 42 of the men. Correlations between ratings and test scores were very slight except for the Otis test. The correlation here was $+.38$. Although this is generally regarded as being too slight for useful application, in view of the low reliability of the ratings, the true relation of intelligence to supervisory ability may be high enough to justify the use of intelligence test scores in selecting supervisors. The results of the Strong Vocational Interest Blank, which was filled out by 115 supervisors, indicate that their interests resemble those of boy scout masters, policemen, office clerks, and accountants. Their interests are very dissimilar to those of lawyers, city school superintendents, advertisers, and architects.

A Psychological Approach to Forest and Human Conservation in the South. JOHN P. SHEA, U. S. Forest Service, Atlanta, Ga.

Economic surveys reveal the rapid decline of cotton in the economy of the South. They indicate that the South may compensate for this loss by utilizing the opportunities offered by her forests. Yet, in spite of the shift of economic opportunity from agricultural to forest resources, the burning of our forests is going on today in much the same manner as it did when forest land needed to be cleared for agricultural use. From 87% to 95% of all forest fires in this region are man-caused. This suggests that the problem is primarily a psychological one, amenable to a psychological approach. It is thought that a remedy may be found in public education in forest values. To this end, the U. S. Forest Service is issuing an invitation to psychologists, sociologists, and educators in the Southern States to cooperate with the Forest Service (1) in the planning of diagnostic studies of the psychological factors involved, (2) in the execution of the plan, (3) in the application of remedial education where indicated. It is suggested that psychologists, educators, and others interested leave their names and addresses with the President or Secretary of this Society.

FRIDAY AFTERNOON SESSION, APRIL 15

PHILOSOPHY

CHAIRMAN, AXEL BRETT

Teleology and the Existence of God. D. J. BOWDEN, Elon College, N. C.

The search for a satisfactory philosophical argument for the existence of God leads, in modern times, to teleology. Whereas William Paley found evidence for an intelligent "watch-maker" who is outside of, and apart from, his creation, the modern teleology tends to find God immanent in the processes of nature. This immanent Being is neither an artisan nor an absolute determiner of destiny, but a power within the world, making for the growth of righteousness, the discovery of truth, and the enhancement of beauty. The most valid argument for the existence of such a Being is found in the empirically verified fact that *good, by its very nature, promotes its own enhancement; whereas evil inevitably sows the seeds of its own destruction.* At the heart of the universe lies this *teleological principle*; it does not point to a "far-off divine event," but to an ever-present urge within nature itself, making impossible the permanence of evil. Herein lies a sound teleological argument for the existence of "that power which is making for the conservation of values," that power which we call God.

Ten Propositions of Value. PETER A. CARMICHAEL, Louisiana State University, Baton Rouge, La.

A series of summations, each justified by a brief exposition, holding that (1) interest theories of value arbitrarily limit the range of value; (2) interest or disinterest is an unreliable sign of value; (3) interest requires differentiae within it and these require each another and another, terminating, if ever, in objectivity rather than interest; (4) interest theories involve subjective idealism; (5) interest itself is objective and is understandable only as a member of the objective order; (6) value occurs wherever there are entities either in or out of relation; (7) value is being; (8) the principle of individuation in value is the degree of implication in the valued thing; (9) value is comprehended proximately in science, ultimately in metaphysics; (10) value theory does not comprise a peculiar new branch of knowledge.

Knowing and Making. LEWIS M. HAMMOND, University of Virginia, Charlottesville, Va.

Man as a rational animal exercises 2 essential functions: first, knowing, where there are given independent, determinate objects of which he acquires concepts. Here the form of the thing known is impressed on the mind; and the thing is the measure of the adequacy of the concept. Second, is the function of making, where there is in the mind of the artist the prior form, which is impressed on external material to make an object. Here the concept is the measure of the adequacy of the thing. But man as knower is at the same time an intellectual artist, and the 2 opposing functions should be unified at that level. From this point of view, the import of Kant's Copernican revolution is seen. It had been supposed that our knowledge must conform to objects, but without success. So why not consider the objects as conforming to the forms of the understanding? The synthetic activity involved in *a priori* knowledge is the proper function of the mind as intellectual artist, imparting form to the materials of sense perception. This is Kant's position of Transcendental Idealism. Further, Kant shows that each dialectical illusion is due to the precritical error of regarding objects from the position of Transcendental Realism; i.e. as things in themselves. If, on the other hand, mind is considered as intellectual *maker*, the Ideas of Reason are no longer vain snares and delusions of the human mind, but take their valid place as regulating the constructive activity of the understanding.

A Scientific Basis for Moral Action. MAX SCHOEN, Carnegie Institute of Technology, Pittsburgh, Pa.

The paper presents the thesis that the moral man can be none other than he who lives as a human being can live, and therefore moral action is action of which a human being is capable. From this standpoint morality is a function of human intelligence, and psychology is pre-eminently the science of morality. The fundamental principle of moral action is deduced from the most outstanding moral theories of history, and it is shown that this principle adheres to the scientific criteria of truth.

Retrospections on Dogmatism. FRITZ MARTI, University of Maryland, College Park, Md.

Dogmatism may be defined as a conditional philosophy or as a philosophy of the conditional alone. Its fundamental characteristic is that it takes for granted that there is nothing unconditional in

human knowledge. It holds that all human knowledge is conditional. All items of conditional knowledge demand proof. Hence, any such item may serve for an axiomatic start. Naïve dogmatism takes for granted its axioms. Critical dogmatism is aware of their axiomatic status. This awareness, coupled with the belief that all knowledge is conditional, prevents the critical dogmatist from an adequate understanding of the unconditional. Neither can the naïve dogmatist understand the unconditional; but he can naïvely take it for something conditional, and he can faithfully describe the aspects of the unconditional in terms of the conditional. The outcome is theism. The theist necessarily arrives at paradoxes, and ends with those disconnected and half-true statements which give him the impression that all our knowledge is piecemeal. Critical dogmatism finds the contradictions of theism unsurmountable and declares for agnosticism. A philosophy, however, which can distinguish between the conditional and the unconditional, can also understand the intrinsic logic of the theistic assertions and can tell the theist what he really means.

Royce's Conception of the Self as a Self-representative System.

DIANA MONSMAN, Hood College, Frederick, Md.

The distinctive features of Royce's philosophy are directly traceable to his complex and shifting conception of the nature of "experience." Various *motifs*—dialectical, voluntaristic, dualistic and realistic, organismic, Darwinian, pragmatic, operationalistic, sociological, ethical, and mystical—operate conjointly to effect a gradual transition from a logically initial position, "The self's experience is reality," to one which may be said to aver: "Self-experience is reality." Epistemological reference is a matter of crucial, if hidden, significance. Roughly speaking, there are 8 ways in which Royce uses the word "experience" to signify external reference of one kind and another, and 4 ways in which it is used to describe nonreferential content. A climactic concept, "self-representation," is finally introduced to explain *how* purpose and reference are to be reconciled, how the "One" brings forth the "Many" and how "external meaning" becomes "internal meaning." To that end Royce analyzes the nature of a mathematical *Kette*. But, for all its acumen, Royce's argument suffers from confusion. A fatal self-contradiction lies, moreover, at its very heart: purposive experience in terms of which the human self is defined as a "concrete determination" is the very thing an infinite and otiosely self-representational system is *not*.

PSYCHOLOGY

SECTION I

CHAIRMAN, LYLE H. LANIER

Form Abstraction by Children. CHARLES H. CRUDDEN, Milligan College, Tenn.

Sixty-five children ranging from 65 to 78 months of age were given the task of abstracting simple learned geometrical figures which were embedded in relatively unknown geometrical figures of varying degrees of complexity. An analysis of the results, composed of a total of 1992 judgments, shows in part: (1) The degree of difficulty in abstracting the simple learned figures increases roughly in direct proportion to the degree to which those figures are embedded in the more complex figures. (2) That-which-is-to-be-avoided in abstraction has almost as much, if not equal, influence in successful abstraction as that-which-is-to-be-chosen. (3) There are wide individual differences in methods used in abstraction. Successful abstraction may be made on the basis of the general shape of the figure-to-be-abstracted as a whole, or by a certain characteristic part or parts. (4) Knowledge of which complex figure contains the correct figure-to-be-abstracted frequently results in a successful response where, previously, no abstraction could be made.

The Measurement of Reminiscence. M. E. BUNCH, Washington University, St. Louis, Mo.

The phenomenon of reminiscence is not being brought in question. It is the suggestion of this paper that the method of measuring reminiscence in the retention of verbal material, generally employed in the studies of this phenomenon since Ballard's study in 1913, is of questionable validity. Further, the objectionable condition which renders the procedure of doubtful value is present regardless of whether one takes as a measure of reminiscence the differences between the immediate and the delayed recall for the group as a whole, or the percentage of the subjects showing improvement in the delayed recall and the amount shown by them. Data are presented which show that under the usual procedure more of the partially learned memory material is recalled in the second than in the first recall test even though the second recall follows the first immediately. The standard procedure in related

studies, *e.g.* of the economy of distributed *vs.* massed practice, of utilizing 2 groups of equal ability is regarded as a more satisfactory method of determining whether, and the extent to which, any improvement in performance after the interval of time is consequent upon the interval in question.

An Analysis of the Backward Conditioning of the Eyelid Response.

JAMES M. PORTER, JR., Carnegie Institute of Technology,
Pittsburgh, Pa.

An attempt to establish conditioned responses in an experimental situation where the onset of the unconditioned stimulus precedes the onset of the conditioned stimulus revealed responses to the conditioned stimulus, not present before paired stimulation, in the case of 7 of the 20 subjects studied. It is concluded that it is unlikely that such responses are conditioned responses, in the usual sense of the term, because of the variability in latency and frequency of response. Analysis of records of paired stimulation fails to reveal any evidence of the elaboration of a reaction to the conditioned stimulus similar to that reported in forward conditioning.

"Relative" vs. "Absolute" Size Discrimination by Chimpanzees.

KENNETH W. SPENCE, University of Virginia, Charlottesville,
Va.

Previous experiments with chimpanzees have revealed the fact that, after being trained to choose the larger of 2 white squares, transposition tests involving pairs of stimuli successively farther and farther away from the original training pair showed a decreasing proportion of responses in agreement with the original training, *i.e.* to the larger stimulus. In the present experiment the effect of increasing the difference in size of the original training pair was studied. Training was given with 4 different pairs of stimuli, the ratios of whose areas were 1.6, 2.0, 2.56, and 4.0 to 1. Following learning each group was given the same transposition test, which consisted of 2 stimuli whose areas were in the ratio of 1.6 to 1. The results of these transposition tests showed that the subjects trained originally on the 2 larger ratios responded only by chance to the larger stimulus, while those trained on the 2 smaller ratios responded almost 100% to the new larger stimulus. The theoretical implications of the results are discussed.

Delayed Response by Chimpanzees to Spatial vs. Nonspatial Cues.

H. W. NISSEN, A. H. RIESEN, and V. NOWLIS, Yale University, New Haven, Conn.

With a delay of about 2 seconds and a technique which discourages the attempted use of spatial cues (by presenting the stimuli originally in an up-down relationship and then in a right-left position for response), 3 young chimpanzees were given delayed response trials with black-white or red-green as the only differentiating cues. All 3 animals reached a level of 75% correct (chance=50%) after 900 or more trials. Accuracy of performance rose slowly to 80% or more, while delays were very gradually increased to 10, 24, and 40 seconds. It is believed that the results give the first statistically satisfactory evidence for nonspatial delayed response capacity in any animal; they also demonstrate the great increase in difficulty (for animals) when nonspatial, as contrasted with spatial, cues are used. Evidence will be presented for and against the hypotheses (a) that delayed response (1-trial learning with only "signified" differential reinforcement) requires an available symbolic mechanism, and (b) that many animals possess such a mechanism for spatial but not for nonspatial differentiae.

Anticipation, Orientation, and the Backward Order of Learning in Maze Habits of the White Rat. B. VON HALLER GILMER, Carnegie Institute of Technology, Pittsburgh, Pa.

An experimental study is reported of the distribution of errors made by a total of 59 white rats, 100 trials each, on 3 enclosed maze patterns. The 3 mazes differed primarily only with respect to the relative positions of the goal. The data on 2 maze patterns, with the goals to the right, substantiated the contention that more errors are made in the goal-pointing blinds. On the third maze pattern, with the goal to the left, there was a preponderance of errors in the non-goal-pointing blinds. A backward order of learning was evident in all 3 mazes, save for the last section of blinds, both goal-pointing and non-goal-pointing.

The Effect of Movement of Stimulus Objects upon Avoidance Reactions in Chimpanzees. GEORGE M. HASLERUD, University of Tennessee, Knoxville, Tenn.

The present study attempts to evaluate the rôle of movement by presenting animate and inanimate forms of the same stimulus object. Five adult and 7 child chimpanzees were tested to find the relation

between age and fear response. By timing and rating variations in the food-taking response, a quantitative measure of the fear reaction was secured that made comparisons possible. Results indicate that adult and child chimpanzees show a similar fear pattern which typically appears and disappears rapidly. The adults react to mounted animals much the same as to live objects, while the children differ in reacting more strongly to the moving object than to the inanimate. Another difference is the quick adaptation of the children to even the live objects, *e.g.* snake, alligator, etc., contrasted with the persistent caution of the adults. The fear-inducing value of a particular animate or inanimate object differs widely among the subjects and does not appear related to age. The significance of the results for the maturation and experience theories of fear will be discussed. Thanks are due the Yale Laboratories of Primate Biology for subjects and facilities.

SECTION II

CHAIRMAN, EMILY S. DEXTER

A Study of the Interrelation of Measures of Verbal Learning.

RICHARD H. HENNEMAN, College of William and Mary, Williamsburg, Va.

Previous investigations of intercorrelations obtaining among measures of different types of learning have indicated generally low positive coefficients. Two earlier studies (unpublished) by the present investigator yielded *r*'s of the usual size except for those between pairs of verbal problems, which were considerably higher. The study to be reported sought intercorrelations among 5 kinds of verbal learning: (1) meaningful, related words; (2) nonsense syllables; (3) Malayan vocabulary; (4) prose (ideas); (5) prose (verbatim). Materials were visually presented with controlled exposure times. Learning periods for the different types of material were spaced 1 week apart. Two problems of each kind of material were learned, the first for "habituation," the second for correlation. All problems were scored similarly (number of constantly-timed trials for perfect reproduction). Fifty college students were subjects. The resulting 10 intercorrelations were all positive, varying from .551 to .721. These unusually high intercorrelations are probably to be attributed to: (1) similarity of the learning material; (2) similar methods of procedure and scoring for all problems; (3) employment

of the "habituation" learning in each case, the better to equate practice and familiarity with the problem among the subjects at the start.

Study of Ability to Wake at a Specified Time. KATHARINE T. OMWAKE, Agnes Scott College, Decatur, Ga.

Twenty-seven college women served as subjects. During the 1st and 4th weeks of the experiment, the control weeks, they recorded the exact time of each waking during the night, and their guess or estimate of the time. During the 2nd and 3rd weeks, the experimental weeks, the subjects attempted to wake themselves without any outside aid at an appointed time, set at a different hour each night, between 12:30 and 6:30. The subjects recorded the actual time of waking and their guess as to the time. There are decided individual differences in ability to wake at a specified time, some subjects being very successful, others having very little success. The best third of the subjects, if they woke at all, did so within 30 minutes of the hour set 66% of the time, within 15 minutes 43% of the time, and within 5 minutes 21% of the time. There is a close relation ($r=+.706 \pm .065$) between ability to wake within 30 minutes of the specified hour and ability to guess the time within 30 minutes of the actual time. The nearer morning the time was set for waking, the greater the accuracy of waking.

Improvements in Technique of Handling Neurotic Patients. KNIGHT DUNLAP, University of California at Los Angeles, Los Angeles, Calif.

Persons who are suffering from neuroses, and others in less characteristic conditions which may reasonably be called neurotic, present certain common characteristics, among which is the habit of introspection, resulting in undue emphasis on feeling and self-relations, and in difficulty in presenting accurately the facts important for the case history. The important points in dealing with such persons are the attitude of the psychologist and the reaction of the patient to that attitude, and the manner of eliciting information from the patient. Our findings have impelled us to a progressively less formal method of approach and the complete discarding of conventionally formulated questions, including the discarding of both printed question forms and tests. Further, an entire absence of doubt concerning the early reports of the patient, even when these are known to be

erroneous, seems essential. For further ensurement of adequacy, coöperation of 2 persons in the "examinations," following a definitely developed technique, has proved useful.

Conscious Functions and Cerebral Activity. D. MAURICE ALLAN, Hampden-Sydney College, Va.

Conscious processes are not identical with neural impulses in the cortex or subcortical regions in any of 3 intelligible meanings of 'identical.' On the other hand, dualistic interactionism has not been formulated so as to be acceptable to the majority of psychologists. The irreducible truth in interactionism is that conscious processes cannot be logically eliminated as causal factors in the total energy-pattern of the organism. Current attempts to prove that consciousness is a nonactive emergent or negligible factor, by reducing learning to conditioned response processes or from neuropathology, are fallacious. James's question, "What is the function of consciousness?", has neither been satisfactorily answered nor ignored. The view here proposed is that consciousness emerges as a super-Gestalt or more inclusive energy-pattern that relates the organism dynamically to a wider environment than the brain as an electrochemical structure could. Such a view is consistent with present-day organismic conceptions and with the known facts of brain localization and brain pathology. This hypothesis is also consistent with, although it does not necessarily imply, the operation of a psychic factor or nonphysical ego.

Sex Differences in Certain Mental Disorders Among Whites and Negroes in Georgia During the Decade 1923-1932. J. E. GREENE and JOHN L. DU PREE, University of Georgia, Athens, Ga.

Seven clinical categories of white and negro patients were compared separately for sex differences on the basis of the following measures: (1) standard rates of first admission; (2) standard death rates; (3) standard discharge rates; (4) standard readmission rates; (5) median age at first admission; (6) median duration of residence prior to death; (7) median age at death; (8) percentage of patients discharged as "recovered"; (9) percentage of patients discharged as "improved"; (10) percentage of patients discharged as "unimproved." Out of 129 comparisons between the sexes, 62 were favorable to males and 67 were favorable to females. Thirty-two of the 62 comparisons favorable to males were among whites while 30 were among negroes. Of the 67 comparisons favorable to females 32 were

among whites and 35 among negroes. Detailed analyses of the inter-sex comparisons made on each of the above 10 factors reveal many marked and statistically reliable sex differences among both races. It is noted, for example, that males of both races live longer than do females. Males tend to have higher discharge rates, higher death rates, and higher readmission rates than do females. Other comparisons are equally significant.

The Status of Certain Mental Disorders in Georgia as Compared with the United States. J. E. GREENE, University of Georgia, Athens, Ga.

For the purposes of this study it has been considered advisable to compare Georgia and the United States on the basis of each of the 10 factors (cited in the abstract of the preceding paper) in terms of a so-called "favorable" status of one area as compared with the other. The distribution of such "favorable" ratings is as follows: (1) standard rates of first admission: Georgia 7, United States none; (2) standard death rates: Georgia 5, United States 2; (3) standard discharge rates: Georgia 5, United States 2; (4) standard readmission rates: Georgia 6, United States 1; (5) median age at first admission: Georgia none, United States 7; (6) median duration of hospital residence: Georgia 5, United States 2; (7) median age at death: Georgia none, United States 7; (8) percentage of discharged patients classified as "recovered": Georgia none, United States 7; (9) percentage of discharged patients classified as "improved": Georgia 5, United States 2; (10) percentage of discharged patients classified as "unimproved": Georgia 3, United States 4. Effort is made to evaluate the significance of the above and related findings.

SATURDAY MORNING SESSION, APRIL 16

PHILOSOPHY AND PSYCHOLOGY

CHAIRMAN, MARTEN TEN HOOR

The Daydreams of Democracy. IREDELL JENKINS, Tulane University, New Orleans, La.

There is an old adage which states that a cat may look at a king. Advancing this as an apology, if not as sufficient justification, the present paper looks at Democracy's political leaders and beseeches them to be realists. This plea is based on the assumption that there are 3 possible forms of discourse: scientific description of what actually is; ideal description of what is potentially in the order of

nature and therefore *can be* and *ought to be* actually; fictional description of states-of-affairs which *would be* desirable, with no adequate regard for the possibility of their actualization. Democracy's leaders have untethered their thought within this third field. They seek ends; they recommend courses, which, though all inherently good, are mutually contradictory and irreconcilable. Democracy must confine its thought to ideal discourse. It must learn that even theory has to make sacrifices: to choose that complexity of goods which it deems best, to renounce other goods incompatible with these, and to accept the evils—the disadvantages and shortcomings—consequent upon its choice. Only thus can Democracy become an effective political theory and cease to be what it now is: an extreme case of thoughtful wishing.

Instrumentalizing Platonic Ideas. MARJORIE S. HARRIS, Randolph-Macon Woman's College, Lynchburg, Va.

Dewey has suggested a return to the Platonic *attitude* toward experience as a present-day need. With the Platonic *views*, however, he is not in accord. Thus his criticism of Plato's Idea of Beauty is that it is the logical outcome of a combination of the escape theory of art and an overintellectualized conception of art. Yet the passages in the *Dialogues*, cited by Dewey to support his criticism, presuppose postulates not unlike those on which Dewey's conception of the social function of art rests; though such a conception is at odds with Dewey's development of the Comtian aesthetic hypotheses. Hence one must conclude that Dewey's own imaginative insight has carried him beyond the bounds of the biological aesthetics he has so eloquently explicated. Dewey's own imaginative vision may yet penetrate to something in Platonic Ideas that suggests the possibility of streamlining them for modernity. Then the artist will find in Dewey an aid in creating that "which never was on land or sea."

Biographical Methods of Detecting Accident-prone Drivers. H. M. JOHNSON, Highway Research Board, National Research Council, Washington, D. C.

By analyzing the records through 6 consecutive years of some 30,000 Connecticut drivers on file in the department of motor vehicles of that state, it was determined beyond question that: (1) accidents are not distributed among the drivers according to the laws of chance; (2) nearly 40% of all the accidents of this population accrued to less than 4% of the drivers; (3) once a driver has been involved

in an accident, his liability to another accident within a prescribed time is approximately doubled; (4) accident-repeaters tend, as a class, to shorten the time between consecutive accidents as they accumulate them; (5) a given number of young drivers kill about 3.5 times as many persons in a year as the same number of drivers in early middle age, although according to their own estimates the younger drivers travel only one-third as far in a year as the others; (6) the annual accidents per operator have been decreasing for 9 years at the rate of about 3% per annum, but all the improvement has occurred among the drivers older than 25 years; (7) as they stand, these data show no definite relation to repeal of the prohibition amendment.

Psychology and the Problem of Social Ideologies. JOHN M. FLETCHER, Tulane University, New Orleans, La.

An ideology differs from a scientific hypothesis by the presence in it of a value component. It appears to be this value component which has hitherto excluded ideologies from scientific consideration. Communism, in spite of its claims, cannot, thinks Becker, be considered scientific so long as it involves not merely matter-of-fact knowledge, but also judgments of value. The same is likewise true of democracy, fascism, and all other social doctrines which attempt to state not merely what *is* but what *ought to be*. Omitting reference to experiments with individual aesthetic and moral judgments, and the experimental studies of Spranger's personality types by Allport and others, it appears that, so far as social or political values are concerned, psychology has adhered in the main to the Titchenerian tradition that science has nothing to do with values. Since the real conflicts in human society today seem to be conflicts of social ideologies rather than of governments or of men, there is practical need for reconsidering the grounds of the Titchenerian tradition. And if value is correctly to be defined in terms of liking and disliking, there is scientific warrant for such a reconsideration.

The Development of Psychology at the University of North Carolina.

KEY L. BARKLEY, Woman's College, University of North Carolina, Greensboro, N. C.

The development of psychology in one of the oldest state universities is traced through a century and a quarter, which period comprehends the prescientific stages and the intermediate steps up to the time a modern laboratory was established. The findings are pre-

sented as a sample of the interesting material which may be discovered through similar studies in other southern institutions. The chief method followed was to search through university records such as catalogues, administrators' reports, bulletins, and official histories. Present and former teachers of psychology contributed much of value through personal statements or correspondence. Items of general interest are: that the word "psychology" was first used in the university's publications in 1860; that probably a course in "psychology" was taught in the University as early as in any other place in the United States; and that the modern laboratory was founded in 1920. The major conclusion is that there is much interesting and valuable historical information to be secured through a study of the development of psychology in southern schools. The writer suggests that the Southern Society sponsor a coöperative project to gather and publish information about the development of psychology in the South.

SATURDAY AFTERNOON SESSION, APRIL 16

PHILOSOPHY

CHAIRMAN, FRITZ MARTI

Fichte's Closed Commercial State. HERBERT C. SANBORN, Vanderbilt University, Nashville, Tenn.

The matrix of all later doctrines of national socialism is an essay published by Fichte in 1800, entitled "Der geschlossene Handelsstaat," the foundation of which is Fichte's theory of property which is itself based on the natural right of the members of a state to be persons, that is, individuals with the right to free activity; property is this right, not the possession of goods, and laws are merely formulations expressing the mutual renunciation of classes and individuals to the exercise of activity in certain spheres, which guarantees freedom of activity in one's own sphere. When an empirical state fails to provide for such free activity and social security in the case of any individual, as, for example, when a condition of unemployment results, law ceases *eo ipso* to exist for such an individual, and the existence of the state is menaced. Hence the state must forestall such a condition of anarchy by abolishing laissez faire and by regulating strictly the spheres of activity, the size of classes and admission to them, and must in general so order affairs that every member of the state shall have his share of the necessities and luxuries of life. For this purpose

changeless prices must be established, all international trade limited to a strict minimum in the hands of the state itself, money limited to national currency, and travel permitted only to the few individuals, scientists, philosophers, artists, etc. who are able to profit by it. The objections to the theory which might have been made in Fichte's time are less cogent today when we have passed from a condition of economic scarcity to one of economic plenty, with the production of innumerable substitutes for natural products and the realization that international trade carries with it the same menace to civilization that resides in national trade when not subject to governmental regulations.

Unity of Nature. ALBERT G. A. BALZ, University of Virginia, Charlottesville, Va.

The paper assumes that the ideal of scientific inquiry, actually operative in the procedures of science, implies 2 elements: first, that science is genuinely attained only in the measure in which an organized whole of ideas is attained; and second, that science implicitly claims that its truths are truths of things. Neglecting the position of the positivist, the implications of these characteristics of science, it is urged, define the essential problems for a philosophy of science. The historical opposition of empirical and rationalistic theories of knowledge indicates that the relation of philosophy to science has always been both anticipatory, as preparation for science, and consummative, as effort to reckon with the results of science in order to complete the organization of ideas. In the latter enterprise, philosophy is the philosophy of science. Science, as organized whole of ideas and as existential in reference, necessarily assumes the ontological correlation of idea and existence and so implies the unity of subject-matter, both as idea and as existence. In consequence, the fundamental problem defining the interrelation of philosophy and science is that of the unity of nature.

The Coincidence of Opposites in the Philosophy of Nicholas of Cusa.

ANNA FORBES LIDDELL, Florida State College for Women, Tallahassee, Fla.

The philosophy of Nicholas of Cusa is based upon the coincidence of opposites: all contradictories are correlatives; the truth of either term is contingent upon the other. Reality is the ultimate simplicity in which contradictories inhere; it is also the ultimate complexity of unending variety. The reality of the finite consists in a limitation of the infinite; the reality of the infinite is established only through

the finite. Neither has existence nor meaning apart from the other. Positive reality is a contraction of absolute reality; whatsoever is—though it be the boundless universe—is, and can be no more than it is. It is limited to existence. There is no limit to nonexistence excepting existence. Reality, then, must contain what *is* and what *is not*, not as component parts of a compound whole, but in simple self-identity. This is sheer non-sense. Sensation and perception never reach such a conclusion, but thought is not confined to the limits of sense experience, as mathematics indicates. This paper undertakes to show how Nicholas uses mathematics in establishing his philosophy of coincidence of opposites.

Justice and Natural Law. HERBERT SPIEGELBERG, New York City.

Justice, if it has any significance at all, presupposes Natural Law. This thesis is supported by an analysis of justice. In philosophical Ethics justice is mainly taken as a virtue, whereas in daily life we speak of justice mostly in connection with specific social relations and with acts aiming at such relations. But even the virtue "justice" cannot be defined without referring to the specific just order which the just action is meant to bring about. The character of objective justice is itself dependent on a peculiar allotment of "goods" best expressed by the phrase "*sum cuique*." This "*sum*" cannot be reduced to arbitrary regulations, for these would in turn evoke the question of their justice. The "*sum*" refers essentially to non-arbitrary primary claims of persons, and to corresponding duties. So, justice depends on the satisfaction of such essential, and in this sense natural social claims. "Natural," however, by no means signifies "discoverable in the scientist's nature," or eternal and unchangeable. To give that signification to the term was a fatal mistake of the historical School of Natural Law. It is suggested that the basis of "natural" claims lies in the objective value they have by being the claims of specific persons.

PSYCHOLOGY

CHAIRMAN, JOHN M. FLETCHER

Should Low-ranking College Freshmen Be Told Their Scores on Intelligence Tests? C. C. Ross, University of Kentucky, Lexington, Ky.

From the lowest fifth of the freshman class at the University of Kentucky experimental and control groups of 40 students each were

formed on the basis of the psychological tests, sex, and fraternity affiliation. Near the beginning of the semester the experimental group was called together and a frank statement made to them regarding their test scores. They were told that it was important to recognize at the outset that they were up against a somewhat different situation in college from other students with better scores. They were assured, however, that experience at the University showed that, if such students were really willing to work and did not make the mistake of trying to carry too heavy a load in school or of undertaking too many activities outside, they could make a satisfactory record. The control group had no advance information. During the first semester 16 of the experimental group passed on all their work and 19 made a point standing of 1.00 or better, as against 10 and 6, respectively, for the control group. During the second semester the corresponding figures were 18 and 14 for the experimental group, and 9 and 6 for the control group.

An Unusual Case of Extra-Sensory Perception. RALEIGH M. DRAKE, Wesleyan College, Macon, Ga.

A report of the results and methods of an investigation of a boy who is supposedly telepathic. A cerebral birth injury appears to be the cause of behavior deviations which for this particular case may be important. Mental retardation is indicated by an IQ of 55, while physical retardation is best indicated by marked underweight and lack of muscular coördination and control. With the Duke ESP cards an average of 16 correct out of 25 is maintained over hundreds of trials. One run of 25 out of 25 correct was observed. Various forms of controls and conditions are described. The results are interpreted in terms of mathematical probabilities, using both the simple and compound methods of computation. The compound method is shown to be inferior because it gives less weight to the chance factor.

The Effect of Rate of Movement in Card Matching Tests of Extra-Sensory Perception. C. E. STUART, Duke University, Durham, N. C.

After their normal (freely preferred) tapping rate had been ascertained, subjects were asked to match unseen symbols at various rates of movement determined by the beat of a metronome. The subject's normal rate was imbedded in the series of rates presented. It was

found that the number of correct matchings at the "normal" rate was reliably greater than the number of correct matchings at rates other than the "normal." Since rates other than "normal" produced chance scores the difference noted was due almost wholly to positive extra-chance scoring at the subject's "normal" tempo.

The Subject-Experimenter Relationship in Tests of Extra-Sensory Perception. J. G. PRATT, Duke University, Durham, N. C.

This is a coöperative experiment with Miss Margaret M. Price. The purpose was to discover, if possible, the effect of different subject-experimenter relations with a view to their bearing upon why some experimenters in tests of extra-sensory perception fail while others, using similar techniques and subjects, succeed. The present experimenters undertook this problem because, using the same general type of subjects (namely, children in an orphanage), one had had only chance results while the other had had highly significant positive deviations. Using their previous tests, made individually, as a background or control, the 2 experimenters adopted a procedure and set of conditions designed to utilize the favorable subject-experimenter relationship of the more successful, at the same time using one of the techniques of each experimenter. Both experimenters were responsible for each step in checking and recording. The results from the beginning gave positive deviations from the mean chance expectation, the average rising in the later series to approximately that of the more successful experimenter in her own earlier work. These experiments appear to demonstrate that the manner of handling the subject during the test is of great importance.

Some Psychological Aspects of Extreme Reading Disability. MILTON B. JENSEN, Louisville, Ky.

When a child learns readily and remembers well in fields other than reading, but reads poorly; when his health, vision, and hearing are satisfactory, and when he has been "schooled," it may be assumed that faulty methods of instruction, so far as he, individually, is concerned, are responsible. That his eye-movements are faulty may mean only that he had poor instruction at a time when motor coördination for reading was particularly difficult. Where social pressure is great, as with reading, and where failure is so readily detected and sensed, it is to be expected that the intelligent and sensi-

tive child will develop unhygienic emotional responses to failure in reading. He may become a behavior problem—unruly, untidy, impudent, etc.—or he may become withdrawn, secretive, and morbid. Initial remedial instruction in such cases should aim at emotional balance. The child should be shown how and why he does not read correctly and should be assured that, being capable in other fields, he can learn to read well. A definite system of training in emotional control is essential. Data are presented for typical cases of severe reading disability together with corrective methods employed over a period of 5 years.

PROCEEDINGS OF THE WESTERN PSYCHOLOGICAL
ASSOCIATION, EUGENE, OREGON,
JUNE 17-18, 1938

FRANK C. DAVIS, SECRETARY, UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

The 1938 meeting of the Western Psychological Association was held on the campus of the University of Oregon, Eugene, Oregon. Approximately 150 psychologists, with a number of visitors representing allied professions, attended the public sessions of the Association. The local committee on arrangements was headed by Howard R. Taylor, chairman of the department of psychology.

The following officers were elected: President: Knight Dunlap, University of California at Los Angeles; Vice-President: Ernest R. Hilgard, Stanford University; Secretary-Treasurer: Frank C. Davis, University of California at Los Angeles.

The members of the Association voted to meet in June, 1939, at Stanford University.

PROGRAM

A New Punched Card Method for the Computation of Certain Statistical Measures. CHARLES J. MARSH, Stanford University.

There has long been need for a computational method which would be suitable for statistical analyses involving more than an occasional correlation coefficient and yet not extensive enough to justify elaborate mechanical techniques. Recently a simplified punched card method has been developed for industrial accounting purposes. An adaptation of this simplified method has been provided for use with the commonly used statistical measures employed in educational and psychological investigations.

Cards of any convenient size may be designed to meet the requirements of a project. Around the edge of the cards holes are punched, with the numbers 1, 2, 4, 7, and 10 printed beneath each set of 5 holes. By punching out the portion of the card just above the hole, scores between 0 and 24 can be coded. A 4x6 card accommodates 15 different sets of test scores.

By means of a ten-inch needle, the punched cards can be sorted in such a way that by following a prescribed routine, such measures as correlation coefficients, means, and standard deviations can be calculated rapidly and accurately. If the data are known to be linear, as in the case of reliability coefficients, no scatter plot need be made. If a scatter plot is desired, its construction is greatly facilitated.

The Rôle of Vision in the Development of Size and Space Concepts of School Children. ELIZABETH HALL, University of Oregon.

The extent to which visual experience is a factor in the development of size and space concepts has considerable theoretical as well as practical pedagogical importance. A preliminary study of the problem has been made by comparing judgments of blind and sighted children in regard to size and space relationships. A test was devised sampling knowledge of compass directions and the relative size of familiar objects indicated in several different ways. Another part of the test was scored to show the percentage of error made in estimating in absolute terms a series of common dimensions.

The reliability of Test I, estimated from self-correlation, was $r_{11}=.54$; for Test II it was $r_{11}=.77$ in the grade range studied (5-8 inclusive). The significance of vision has been evaluated by comparing the performance of blind and sighted public school children on these tests and on other psychological measures.

An Investigation of Prenatal Position and Handedness. REBECCA OVERSTREET, University of Oregon.

Moss has advanced the theory that laterality is congenitally determined. According to this view the arm which is toward the abdomen of the mother during the gestation period enjoys greater freedom of movement, is exercised more, and comes to be preferred.

In the first part of this investigation the eyedness and handedness of 85 subjects were compared with the birth attitudes. Records of the latter were obtained from a local obstetrician. The correlation coefficients between birth presentation and laterality clustered around zero. In the second part of the study the constancy of the prenatal position was investigated. It was found that birth presentation is an unreliable index of prenatal position. In fact, within the 24 hours preceding birth more than half of the prenates altered their positions. These facts point to the conclusion that birth presentation and prenatal position probably have little, if any, effect upon subsequent laterality.

An Item Analysis of Peterson's "War" Scale. LEONARD W. FERGUSON, Stanford University.

Factor analysis of intercorrelations among items of Peterson's "War" scale showed 3 factors required for their explanation. This indicates that the statements do not lie in one continuum. Therefore, criteria used in their selection should be supplemented.

Individual Differences in Aspiration-Level in a Standard Sequence of Objective Success and Failure Situations. JOHN W. GARDNER, University of California.

The level of aspiration in 32 college men was measured in connection with performance on 4 tasks: card sorting, digit-symbol substitution, a multiple choice test of opposites, and a complicated activity consisting of cancellation performed while counting backward by 3's. False scores were reported to the subject—scores so chosen as to provide all subjects with an identical pattern of objective success and failure situations. The pattern was also the same for all 4 tasks, although the scores involved were not identical.

Frank's definition of the level of aspiration as 'the future performance level in a task which an individual, knowing his past performance level in that task, explicitly undertakes to reach' was accepted; after each trial a score was reported to the subject, and he was then asked to set his aspiration-level for the next trial. Reliabilities of the measures finally used range from $.79 \pm .06$ to $.98 \pm .005$, most of them being above .90. Intercorrelations between tasks for these measures range from .42 to .69 when corrected for attenuation.

Progressive Changes in the Level of Aspiration Within Learning.

EDWARD M. SAIT, Stanford University. (Introduced by E. R. Hilgard.)

The purpose of this study was to find the effect on the relation between performance and level of aspiration of (1) progressive changes in the difficulty of the task, and of (2) performance level in relation to the scores of competing members of a group. The subjects were university students working in groups of 3 to 6. The learning material consisted of sets of problems in subtraction, graded for difficulty. Three series of increasing difficulty, uniform difficulty, and decreasing difficulty were used. Each series was represented in the competing groups, although the subjects were not aware of the differences in their materials. Subjects with the easy material tended

consistently to underestimate their probable progress; subjects with the hard material tended consistently to overestimate their probable progress. Difficulty of material influenced the estimates more than the scores relative to other members of the competitive group.

Student Attitudes on War and Peace. RALPH H. GUNDLACH, University of Washington.

An elaborate questionnaire, involving general warlike attitudes, opinions as to causes and cures of war and as to personal conduct in event of war, was filled out by a large number of college students at Washington, Nebraska, N.Y.U., and Princeton. Comparisons between the groups are made.

A brief set of questions on "What We Can Do To Keep Peace," filled out this year at Washington, provides a basis for determining the direction of change of opinion, here, toward social security.

Another Test Case for ESP. JOHN L. KENNEDY, Stanford University.

Errors in recording due to split attention are shown in the present paper to be potent factors in producing spurious mathematical evidence for ESP with some of the Rhine methods. These errors are channeled in the direction of increasing the score by positive belief, excitement, expectancy, and suggestibility on the part of the recorder. In one set of 1000 trials with the Telepathy-Card test, the critical ratio with errors left in the record was $+2.26$; with errors removed, it was -1.33 . The necessity for completely independent records in ESP experiments becomes obvious. Neither independent recording nor controls on the accuracy of the recorder may be found in the majority of papers reporting positive results in favor of ESP.

George Meredith as Psychologist. KATE GORDON, University of California at Los Angeles.

The writer of realistic fiction has aims which agree at least in part with the aims of psychologists. He describes men and women in their social predicaments. We ask about a psychologist: What are his hypotheses? What instrumentation does he use? What are his statistical procedures? What are his conclusions? Every distinct person presented by a novelist is an hypothesis. The genius of the writer is shown in the details by which these hypotheses are supported. Meredith lacks instrumentation unless we accept a critical mind as a research instrument. He deals in the statistics of indi-

vidual cases. These may show us the range of human natures. Individuals show us the possibles, though they cannot tell us the probables. Meredith's "results" are those marvelous studies of character in the Egoist, Richard, and others.

A Valuation of High School English Literature Courses. ROBERT R. REICHART, Oregon State College.

This paper reports an attempt to measure some of the permanent results obtained from high school English literature courses by determining the present literary tastes of 542 students attending Oregon State College. These students claim that they like to read, but their reading consists mainly of popular magazines and light fiction. Some influence of the high school English literature courses is indicated in the selection of their favorite books, but there is little carry-over from the required reading of books by "standard" authors to the voluntary reading of other books by the same authors. Apparently these students have not received lasting desirable reading interests. Having found, according to their own statements, the so-called "literary" books dull and dry, they give suggestions as to what they believe should be taught in English literature courses in high school.

Extra-Sensory Perception. KNIGHT DUNLAP, University of California at Los Angeles.

A critical appraisal of the asserted "evidence" offered in support of the validity of extra-sensory phenomena.

Behavior Variables and Climate. RAYMOND H. WHEELER, University of Kansas.

Report of an intensive psychological study of human behavior variables in relation to climate.

An Experimental Test of Snoddy's Theory of Mental Growth. ERNEST R. HILGARD, Stanford University.

An experiment was designed to test a theorem based on Snoddy's characterizations of primary and secondary growth. The theorem predicted that early spacing and later massing should be more advantageous than early massing and later spacing. The learning task selected was the visual-manual coordination of the Koerth pursuit rotor. Two groups of 25 subjects were practiced individually. After preliminary trials for purposes of comparing the initial abilities of the 2 groups, one practiced for 14 trials with decreasing intervals between trials, the other for a like number of trials, but with increas-

ing intervals. Trials were of one-minute duration, and the total period of practice covered 43 minutes. The group with increasing time intervals scored significantly higher at the end than the group with decreasing time intervals, contradicting the theorem based on Snoddy. The experiment was done in collaboration with Leon R. Doré.

"Schematic Sow Bugs" and Discrimination Learning. EDWARD CHACE TOLMAN, University of California.

When animals trained on one pair of stimuli are transferred to another pair (in the same dimension) they sometimes react to this new pair as if their training on the first 2 had built up a relative choice and sometimes as if it had built up, rather, an absolute choice (positive or negative) of one of the first 2 stimuli. As explanation, Spence has assumed generalizations of positive and negative excitatory tendencies to scale values above and below the original ones. On a basis of such generalization curves he predicts the results.

The present paper seeks to incorporate an explanation similar to Spence's into a wider theoretical scheme. All animals are conceived as tropistic organisms, that is, as in essence mere sow bugs. And the discriminanda constitutive of any dimension are conceived as capable of being represented (theoretically) as lying at different spatial angles with respect to the given discriminating individual.

The Synthesis-Analysis Dilemma in Psychological Theory. JEAN McQUEEN-IRWIN, Scripps College.

An historicocritical study of the disparity between a "synthetic" (Gestalt) approach, emphasizing the primacy of the whole, and an "analytic" (structuralistic or behavioristic) approach, implying the primacy of parts. The synthesis-analysis dilemma arises because, despite contrariness of assumptions, each approach must attempt to account for the term emphasized by the other.

Historical development of psychology reveals a persistent tendency towards the bipolar treatment of synthetic and analytic aspects. Appraisal of the logical status of "wholes" and "parts" demonstrates that a methodologically useful distinction, rather than a mutually exclusive dichotomy, is involved. The dilemma is therefore not based upon inherent contradiction between them.

The real theoretical dilemma resides in a cleavage between dynamic whole-and-part *actuality* yielding description only, and hypothetical *constructs* yielding scientific, but perhaps meaningless, prediction. It is resolved only by postulates realistic in relation to the

actual and scientific in relation to prediction. Current attempts in this direction are cited.

An Analysis of a Group of Most Differentiating Items of the Thurstone Personality Schedule. GEORGE M. KUZNETS, Stanford University.

Hurdles to Be Overcome in the Psychology of Music. (Address of the president of the Association.) PAUL R. FARNSWORTH, Stanford University.

Experimental Re-examination of Delayed Response Concepts and Methods. J. T. COWLES, University of California.

This is a preliminary report of experiments designed in accord with the hypothesis that the "presentation" and "functioning occasions" (Tolman) in the typical delayed response are more adequately described as one discriminatory training trial followed, after a period of retention (delay), by a transfer test trial in a more or less altered situation. Tests were made of the prediction that the closer the response in the training trial approximates in its grosser characteristics the response in the test trial, the more efficient will be the retention after delay. These were carried out with 3 groups of about 30 albino rats. All were first given uniform and thorough training on a simple black-white discrimination in a Y-shaped discrimination box. Half were trained to go through a black door for food and half to go through a white door for food. Each of the 3 groups was then given extended series of "delayed response" transfer tests with a different type of training trial for each group.

Data are presented which clearly demonstrate the remarkable efficacy of a single, unrewarded but complete run through the apparatus as compared with an incomplete run up to the positive stimulus, or even the mere sight of and turning toward the positive stimulus, in leading to a successful run to food after the "delay" interval.

The hypothesis is favored that retention in "delayed response" is not qualitatively different from that involved in the transfer of discrimination training.

Effects of Distribution of Reinforcement upon the Acquisition and Extinction of Conditioned Responses. LLOYD G. HUMPHREYS, Stanford University.

Simple conditioned eyelid responses were established to an illumination change followed by a puff of air to one cornea under

3 conditions of reinforcement. One group had 96 trials always reinforced. A second group had 48 reinforced and 48 nonreinforced trials, presented in a random order. The third group had the 48 reinforced trials of group 2, but had rest intervals where nonreinforced trials had occurred in the latter group. Reinforcement in all groups was immediately followed by 24 extinction trials. Acquisition in groups 2 and 3 is closely comparable, but may be slightly depressed relative to the performance of group 1. In extinction groups 1 and 3 are most nearly comparable, the course of extinction being rapid and negatively accelerated. Group 2, however, extinguishes relatively slowly and remains superior throughout the 24 trials. The bearing of these results upon conditioning theory is discussed.

Experiments on "Unconscious Whispering." JOHN L. KENNEDY, Stanford University.

This paper describes preliminary experiments on the Hansen-Lehmann hypothesis that some alleged cases of "telepathy" may be caused by (1) the unconscious production of sound cues related to the material on which the sender is concentrating and (2) auditory hyperesthesia of the receiver.

Artificial auditory hyperesthesia was obtained by the use of 2 large parabolic sound reflectors, so constructed that a sender, who was blindfolded and unaware of the purpose of the experiment, could be comfortably seated with his nose and mouth at the focus of one while the receiver could sit with his ear at the focus of the other.

Results secured under the following conditions are discussed: (1) sender given kinesthetic ("mental shouting") instructions for imagery; receiver with knowledge of the experiment; (2) sender given "visualization" instructions; receiver with knowledge.

Complexity of Response as a Factor in Emphasis. E. H. PORTER, JR., University of Oregon. (Introduced by Robert W. Leeper.)

The Law of Emphasis in its present form leaves open the question of what factors operate to make the efficacy of emphasis possible. It is suggested that a major factor is the complexity of response to be made to the emphasized cues.

Series of number pairs were presented to 3 groups of subjects. One group always received the emphasis (lights) on the correct number and was instructed to press a key corresponding in position to the correct number. A second group always received the emphasis

on the wrong number and was instructed to press the key corresponding in position to the correct number. A third group received emphasis on the correct number and was instructed to press the key corresponding in position to the wrong number. The results suggest that the more complex responses hinder learning.

Differential Effects of Guided Trials in Subjects Reporting Different Methods of Learning a High-Relief Finger Maze. FRANK C. DAVIS, University of California at Los Angeles.

In his presidential address before the American Psychological Association Tolman quoted Carr as follows: ". . . a certain number of errors must be made and eliminated before the subject is ever able to run the maze correctly. Correct modes of response are established in part by *learning what not to do*." (Italics Tolman's.) The results in the present experiment suggest that generalizations like the one cited, concerning the effect of guided trials in human maze learning, must be recast, since a number of subjects performed in a manner quite different from the type of performance implied in the above quotation. Conclusions reached by Scott, Warden, Lumley, Husband, and Wolfe, and by the author in a previous report, concerning the validity of subjects' reports in human maze learning experiments, are reviewed and emphasized.

After-Images. JOSEPH E. MORSH, University of British Columbia.

A simple technique for observing positive after-images was tried out with 116 subjects of both sexes. After a dark adaptation period of 2 minutes the subjects, who ranged in age from 6 years to adulthood, were required to blink their eyes toward a window which faced the sky and then report the images seen in their closed eyes. Forty-two subjects were given 10 trials each, the others being given 2 trials except in certain cases of unusual persistence of the images. After exposure to the stimulus there regularly followed a latent period of between 5 and 6 seconds' duration. This was followed in all subjects by the primary positive after-image which usually lasted from 5 to 20 seconds. The positive image was often followed by a negative image, but great variety in the number, order, and length of subsequent images was found. Many of the younger subjects and few of the adults experienced successions of images, some of these continuing for 19 minutes or more. The method offers possibilities for the investigation of such problems as the nature of positive and negative after-images, retinal activity, and eidetic imagery.

The Effect of Maze Pattern on the Distribution of Errors in Animal Mazes. JACK BUEL, Wesleyan University.

The usual explanation of the differential error order of maze blinds is in terms of the learning mechanism. Recent work indicates that the relative difficulty of blinds may be largely the result of other factors. A basic 14-unit T-maze pattern was examined in terms of the error orders of first and later trials when it was in 14-, 18-, and 22-unit settings; in the form of elevated and alley mazes; with fixed and interchanged units; and when used with normal and blind rats under differing conditions of drive and reward. The reliability coefficients of first and later trial error orders are all above .91. The median corrected first trial intercorrelation is .79 (range: .59-.89); later trials, .77 (range: .43-.99). The median corrected coefficient expressing the relation between first and later trial error orders is .79 (range: .59-.89). The relationship of these findings to learning theory is discussed.

The Effect on the Goal Gradient in Rats of the Introduction of a Barrier in the Path to the Goal. JOHN OHLSON, Stanford University.

The goal gradient phenomenon was studied to find which of 2 theories applied the better: (1) that the goalward increase in speed is a product of the greater ease of conditioning in proximity to the goal; or (2) that it is a result of the greater attractiveness (valence) of the goal at points closer to it. By introducing a barrier in the path to the goal, the proximity of any point in the path to the goal would not be altered, but an unattractive factor which would interfere with the positive "valence" of the goal would be added.

When 12 rats were run in an octagonal runway toward a food goal, having to cross a water barrier, the position of which was varied in relation to the start and the goal, it was found that the speed of running was reduced as the barrier was approached—an effect better described in terms of positive and negative valences than by ease of conditioning in proximity to a goal.

A Quantitative Study of Sexual Reactivation in Castrated Male Rats. CALVIN P. STONE, Stanford University.

A year ago I reported on the reduction of sexual drive in adult male rats after castration. When these males had become totally inactive under test conditions they received subcutaneous injections

of *testosterone propionate*. Subsequent tests showed that the males became sexually active within a few days and that this activity was sustained as long as periodic injections of the male hormone were administered. Quantitative data from these tests are reported. With cessation of the injections, sexual activity gradually declined in aggressiveness. Renewal of injections was accompanied immediately by a return of sexual aggressiveness. Control injections of normal saline and of oil of sesame, the solvent for the hormone, had no activating effects.

Transfer of Training in the Albino Rat on Horizontal and Inclined Elevated Mazes of the Same Pattern. ROBERT B. VAN VORST, Stanford University.

The object of this experiment was to determine whether the net transfer from an inclined elevated maze to its mirror image is significantly greater than that from a horizontal elevated maze to its mirror image. Comparable training methods and similar groups of animals were used.

The data indicate that groups trained on the inclined mazes learned in fewer trials and with fewer errors than those trained on horizontal mazes of similar pattern. The net transfer in all cases was positive. When the net transfer is expressed in terms of savings, the percentage of transfer from the inclined maze to its mirror image is greater than that from the horizontal maze to its mirror image. Additional data dealing with subordinate problems in this study are presented.

Metrazol and Insulin Therapy in Schizophrenia. JOHN L. HASKINS, Morningside Hospital, Portland, Ore.

A demonstration (by means of motion pictures taken with the collaboration of Dr. L. F. Beck of the University of Oregon) of the effects of metrazol and insulin therapy, with a brief history of the development of said therapy in Europe and in America, and an evaluation of the results obtained to date.

Motion Picture Films of Special Interest to Psychologists. LESTER F. BECK, University of Oregon.

PROCEEDINGS OF THE NINTH SPRING MEETING OF THE EASTERN PSYCHOLOGICAL ASSOCIATION

H. S. OBERLY, SECRETARY-TREASURER, UNIVERSITY OF
PENNSYLVANIA

The Ninth Annual Spring Meeting of the Eastern Branch of the American Psychological Association was held in New York City on April 1 and 2, 1938. On Friday the meetings and banquet were held in the Hotel Commodore, and on Saturday, meetings were held at New York University, University Heights. The meetings were attended by 343 registered members and 277 registered guests, the total of 620 being the largest number present at the sectional meeting.

The presidential address, "Experimental Analysis of Instinctive Behavior," was delivered by Professor Karl S. Lashley, Harvard University, at the banquet on Friday evening. Approximately 300 persons were present.

The scientific program consisted of 102 papers which were presented in 13 various sections. Three papers were presented in a general meeting on Saturday afternoon.

Elections. *President*, 1938-1939, K. M. Dallenbach, Cornell University; *Board of Directors*, K. M. Koffka, Smith College, 1938-1940; H. W. Helson, Bryn Mawr College, 1938-1941; C. W. Bray, Princeton University, 1938-1941.

Committees Appointed. *Program*: T. W. Forbes, Harvard University, Chairman; Edna Heidbreder, Wellesley College; C. Jacobsen, Cornell Medical College. *Nominating*: I. Lorge, Teachers College, Columbia University; G. Kreezer, Vineland Training School; Myrtle B. McGraw, Babies' Hospital, Columbia Medical Center.

The Association voted favorably: (1) to change the name from "Eastern Branch of the American Psychological Association" to the "Eastern Psychological Association, affiliated with the American Psychological Association"; (2) to hold a two-day session in 1939; (3) to accept the invitation to hold the 1939 meeting at Bryn Mawr College on March 31 and April 1; (4) to discontinue the practice of printing the abstracts of papers in the *PSYCHOLOGICAL BULLETIN*; (5) to adopt a budget of \$220 for 1938-1939.

Next Meeting. The invitation to hold the next Annual Spring Meeting at Bryn Mawr College, Bryn Mawr, Pa., on March 31 and April 1, 1939, was accepted.

The following papers were presented:

APPLIED PSYCHOLOGY

CHAIRMAN, DOUGLAS A. FRYER, NEW YORK UNIVERSITY

Some Work on the Evaluation of Rating Techniques. BEATRICE CANDEE and EMILY KELLOGG, Vocational Service for Juniors and New York State Employment Service.

New Tests of Visual Perception. CHARLES A. DRAKE, New York City.

Who Gets a Job? HAZEL PETERSON GAUDET, University of Newark. (Introduced by Paul F. Lazarsfeld.)

The Adjustment and Attitudes of Applicants for Professional Placement. M. S. VITELES and M. A. SEIDENFELD, University of Pennsylvania.

Age and Performance Relationships Among Accident-Repeater Automobile Drivers. T. W. FORBES, Harvard Bureau for Street Traffic Research.

Additional Variables in Trade-Name Confusion. JOHN G. JENKINS, University of Maryland.

The Effects of Alcohol on Finger Conditioning and on Artificial Language Tests. LEONARD C. MEAD, University of Rochester.

Taxonomy in Psychology. HAROLD C. BROWN, New York City.

CONDITIONED RESPONSE

CHAIRMAN, CLARK HULL, YALE UNIVERSITY

Some Aspects of the Conditioned Motor Reflex in the Goat. QUIN F. CURTIS, Cornell University Medical College.

Conditioning and Problem-solving Behavior. EDWARD GIRDEN, Brooklyn College.

The Conditioning of Galvanic Responses to Verbal Reactions of the Subject and the Rôle of Patterns of Association Learned Prior to This Conditioning upon Its Subsequent Generalization. NEAL E. MILLER, Yale University.

Backward Conditioning of the Eyelid Response. J. M. PORTER, JR., Carnegie Institute of Technology.

Music, Art, and the Conditioned Response. G. H. S. RAZRAN, Columbia University.

An Experiment in the Use of Multiple Conditioned Stimuli and Extinction in Tests of Hearing. CHARLES N. WINSLOW, Brooklyn College.

Relation of Age to Rate of Conditioning. JAMES A. WILSON, University of Rochester.

Resistance to Extinction as a Function of the Number of Reinforced Responses. STANLEY B. WILLIAMS, Yale University. (Introduced by Clark Hull.)

HUMAN MEMORY AND LEARNING

CHAIRMAN, ARTHUR I. GATES, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

Right and Left Dominance in Feet, Measured by Toe Co-ordinations. L. PEARL GARDNER, Cornell University.

General and Specific Factors in Transfer of Training. MARY AGNES GORDON, New York City.

Retroactive Inhibition as a Function of Accentuated Serial Position. JOHN A. MCGEOCH, Wesleyan University.

Memory for Unpleasant Experiences as Dependent on the Nature of the Aversion. JAMES J. GIBSON, Smith College.

Bilingual Retroactive Inhibition. CARROLL C. PRATT, Rutgers University.

Memory Trace for Angles. NELSON G. HANAWALT, New Jersey College for Women.

An Experiment in Generalizing: A Unicursal Problem. JAMES L. GRAHAM, Lehigh University.

Backward and Forward Association as an Organizing Act. ERNEST PRIMOFF, New York University.

SOCIAL PSYCHOLOGY

CHAIRMAN, GEORGE VETTER, NEW YORK UNIVERSITY

Community of Values as a Factor in Friendships of College and Adult Women. HELEN M. RICHARDSON, New Jersey College for Women.

- Assimilation and Determining Tendency in Photography.* A. A. ROBACK, Cambridge, Massachusetts.
- The Determination of Judgments by Group and Ego Standards.* SOLOMON E. ASCH, Brooklyn College.
- Prediction of Social Events.* HADLEY CANTRIL, Princeton University.
- Studies in the Principles of Judgments and Attitudes. III. The Influence of Political Attitude on the Organization of Judgments.* HELEN BLOCK, Brooklyn College.
- Social Psychological Implication of Population Trends.* J. B. MALLER, Teachers College, Columbia University.
- Emotional Expression in Chinese Literature.* OTTO KLINEBERG, Columbia University.
- A Comparison of the Sexes in Their Attitudes and Beliefs About Women.* PHILIP M. KITAY, Teachers College, Columbia University.

ABNORMAL PSYCHOLOGY

CHAIRMAN, F. L. WELLS, BOSTON PSYCHOPATHIC HOSPITAL

- The Effect of Alcohol on Brain Arteries.* H. M. HILDRETH and EDWIN E. MCCARTHY, Syracuse University.
- Significant Factors Relating to the Parents of Young Psychotics.* HERBERT BARRY, JR., Tufts College.
- Behavior of Rats in a Conflict Situation.* J. McV. HUNT, Brown University.
- A Study of Ratings of Vividness of Imagery with Special Reference to That of Somnambulists.* ARTHUR JENNESS, University of Nebraska and Harvard University. (Introduced by E. G. Boring.)
- The Kohs Blocks—A Qualitative Analysis of Responses of Patients with Frontal Lobe Lesions.* AARON B. NADEL, Columbia University and Montefiore Hospital.
- Worries of College Freshmen.* JAMES PAGE and RUTH LUNGER, University of Rochester.
- Motor Function in the Mentally Diseased.* WALLACE H. WULFECK, Yale University.
- A Critique of Extra-Sensory Perception.* H. ROGOSIN, New York City. (Introduced by T. C. Schneirla.)

CHILD PSYCHOLOGY

CHAIRMAN, CATHARINE COX MILES, YALE UNIVERSITY

- Radio and the Child.* WESTON R. CLARK, University of Maryland.
- Personality Patterns in Young Children; Their Presence and Approaches to Their Study.* EUGENE L. HOROWITZ, State Department of Education.
- A Study of the Development of Insight in Preschool Children.* BERNARD SOBEL, New York University.
- A Method and Apparatus for the Study and Treatment of Enuresis.* O. H. MOWRER, Yale University, and WILLIE MAE MOWRER, New Haven Children's Center.
- Imitation Under Controlled Developmental Conditions.* WAYNE DENNIS, Clark University.
- Analyses of Abilities of Six-Months- and One-Year-Old Children as Tested by the Gesell Schedules.* T. W. RICHARDS, Antioch College.
- A Comparative Study of the Intelligence of Deaf and Hearing Children.* N. NORTON SPRINGER, Adolescents' Court, Brooklyn.

INSTRUCTIONAL FILMS

- The Least of These*, a color film showing the historical development and current treatment of mental deficiency. L. N. YEPSON, Director, Division of Classification and Parole, State Department of Institutions and Agencies, Trenton, New Jersey, in charge.
- The Nervous System, Fundamentals of Acoustics, and Early Social Behavior*, three short films. H. A. GRAY, Erpi Picture Consultants, New York City, in charge.

EXPERIMENTAL PSYCHOLOGY

CHAIRMAN, KURT KOFFKA, SMITH COLLEGE

- Postural Steadiness over Longer Time Periods.* HAROLD SEASHORE, Springfield College.
- The H. C. Brown Shrinkage Phenomenon: A New Approach to the Study of Perception of Real Motion.* HEINZ ANSBACHER, New York City.

- A Quantitative Comparison of the Photographic and the Electrical Methods of Recording Eye-Movements.* L. CARMICHAEL and A. C. HOFFMAN, University of Rochester.
- A Formula for the Measurement of Constancy.* HARRY HELSON, Bryn Mawr College.
- Variability in the Affective Judgment.* WILLIAM A. HUNT, Neuro-Psychiatric Institute of the Hartford Retreat.
- Further Evidence Regarding Preferential Judgment of Polygonal Forms.* C. M. HARSH, J. G. BEEBE-CENTER, R. BEEBE-CENTER, Harvard University.
- Is Extra-Sensory Perception Another Name for Free Association?* FREDERICK H. LUND, Temple University.
- An Analysis of the Duke Experiments in Parapsychology.* STEUART H. BRITT, George Washington University.

PHYSIOLOGICAL PSYCHOLOGY

CHAIRMAN, ERNEST G. WEVER, PRINCETON UNIVERSITY

- The Relationship Between the Striate Area and the Superior Colliculus in Brightness Discrimination.* E. E. GHISELLI, University of Maryland.
- Intelligence After Removal of Frontal Lobe Tissue in Man: 3 Cases.* D. O. HEBB, McGill University.
- Figure-Ground Perception in Patients with Cortical Lesions.* M. R. HARROWER, McGill University.
- Emotion and the Delta Index of the Electroencephalogram.* HUDSON HOAGLAND, E. EWEN CAMERON, and MORTON A. RUBIN, Clark University and Worcester State Hospital.
- The Conduction of Sound Through the Middle Ear.* CHARLES W. BRAY, Princeton University, and GEORGE P. HORTON, University of Washington.
- The Reactions of Untrained Subjects to Warm-Cold Grills.* WILLIAM LEROY JENKINS, Lehigh University.
- Neurocirculatory Reaction and the Recall of Interrupted and Completed Tasks: A Preliminary Study.* THEODORA M. ABEL, New York City Trade Extension Classes.
- Further Studies on the Psychophysiology of Boredom: The Effect of 15 mg. of Benzedrine Sulfate on the Report of Boredom, Certain*

Vascular Measures, and Other Factors. J. E. BARMACK, College of the City of New York, and A. T. POFFENBERGER, Columbia University.

EDUCATIONAL PSYCHOLOGY

CHAIRMAN, RUDOLF PINTNER, TEACHERS COLLEGE,
COLUMBIA UNIVERSITY

The Value of Intelligence, Personality, and Vocational Interest Tests in a Guidance Program for College Freshmen. LOUISE E. ALTENEDER, State Teachers College, Paterson, New Jersey. (Introduced by C. E. Benson.)

The Measurement of Progress in Remedial Reading. FREDERICK B. DAVIS, Avon Old Farms, Connecticut. (Introduced by J. C. Flanagan.)

Reading and Ninth Grade Achievement. EVA BOND, Teachers College, Columbia University.

A Study of Progress Made by Pupils Under Remedial Instruction in Arithmetic. FRANCES S. SOBEL, New York City.

Measurement of the Relative Dominance of Certain Interest Values and Their Relationship to Some Aspects of Emotional and Vocational Adjustments. EDWARD M. GLASER, Teachers College, Columbia University.

The Study of Values Test and Scholarship. T. A. LANGLEY, Wesleyan University.

The Value of the Bernreuter Personality Inventory for the Selection of Groups upon Which Aptitude-Scholarship Correlations Are To Be Based. BERT R. SAPPENFIELD, New York University.

Further Study of a Group of Superior Children Chosen for Special Instruction in a New York City High School. MARGARET J. DRAKE, James Monroe High School.

COMPARATIVE PSYCHOLOGY

CHAIRMAN, T. C. SCHNEIRLA, NEW YORK UNIVERSITY

The Startle Response in the Adult Guinea Pig. ROBERT W. BURNHAM, University of Rochester.

A Quantitative Investigation of Optokinetic Head Nystagmus Following Cerebral Lesions in the Guinea Pig. KARL U. SMITH, University of Rochester.

The Relative Effects of Partial Decortication in Infancy and Adulthood upon the Maternal Behavior of Primiparous Rats. FRANK A. BEACH, American Museum of Natural History. (Introduced by K. S. Lashley.)

The Daily Activity Cycle of the White Rat. H. SCHLOSBERG and J. McV. HUNT, Brown University.

Some Observations on Tonic Immobility in the Rhesus Monkey (Macaca Mulatta). JOHN P. FOLEY, JR., George Washington University.

The Visual Acuity of Pigeons. R. D. CHARD, Princeton University.

Ontogeny of the Righting Reflex in Young Mammals. JOHN WARKENTIN, University of Rochester.

ANIMAL LEARNING

CHAIRMAN, CARL WARDEN, COLUMBIA UNIVERSITY

The Rat's Speed-of-Locomotion Gradient Throughout a Series of Trials. CLIFFORD T. MORGAN, University of Rochester.

The Effect of Blinds Which Terminate in a Common Space on the Maze Learning of Rats. JACK BUEL, Wesleyan University.

Recovery from Specific and Generalized Effects of Non-Reward. DOUGLAS G. ELLSON, Yale University.

Conditions Influencing Response Decrement in a Non-Reward Situation. P. M. FITTS, University of Rochester.

Decrement in Maze Running as a Function of Changing the Time Interval Between Trials. GLEN L. HEATHERS, Yale University.

Experiments on Anticipatory Learning in White Rats. ALBERT V. FRIEDMAN, Columbia University.

Approach-Avoidance Conflict as a Function of Strength of Drive and Strength of Punishment. JUDSON S. BROWN, Yale University.

Discrimination Learning and Delayed Response to Visual Stimuli by Chimpanzees. AUSTIN H. RIESEN and VINCENT NOWLIS, Yale University.

PERSONALITY

CHAIRMAN, GARDNER MURPHY, COLUMBIA UNIVERSITY

A Technique for Measuring the Social Level of Adult Personality.

JEROME M. SEIDMAN, Teachers College, Columbia University.

- Some Relations Between Family Background and Personality.* PHILIP EISENBERG, Columbia University, and JUNE CARPENTER, Barnard College.
- A Study of the Structure of a Generalized Attitude, Optimism-Pessimism.* JOHN C. FLANAGAN, Co-operative Test Service of the American Council on Education.
- The Relationship Between Physiological Maturation and the Interests and Attitudes of Boys.* RICHARD T. SOLLENBERGER, Yale University.
- An Experimental Analysis of "Level of Aspiration."* ROSALIND GOULD, Columbia University. (Introduced by Gardner Murphy.)
- The Effect of Theistic Beliefs upon Recall.* WALTER WATSON, Teachers College, Columbia University. (Introduced by G. W. Hartmann.)
- Social Behavior, Personality, and the Dominance-Syndrome.* A. H. MASLOW, Brooklyn College.
- The Judgment of Personality on the Basis of Brief Records of Behavior.* STANLEY GODDARD ESTES, Northeastern University.

PSYCHOMETRICS

CHAIRMAN, HENRY GARRETT, COLUMBIA UNIVERSITY

- Performance of School Children on the Revised Stanford-Binet and the Kent E-G-Y Test.* ARTHUR L. BENTON, New York Hospital.
- A New Method for Selecting Test Items.* ROBERT F. BARRY, University of Rochester. (Introduced by J. W. Dunlap.)
- An Empirical Evaluation of "Verbal," "Numerical," and "Spatial" Factors.* ISIDOR CHEIN, College of the City of New York. (Introduced by H. E. Garrett.)
- A Technique for Measuring Likemindedness.* JOSEPH ZUBIN, National Committee for Mental Hygiene.
- Effect of Administration Time on Test Reliability and Validity.* VINCENT J. SHARKEY, University of Rochester.
- The Training Program in the Field of Clinical Psychology.* ELAINE F. KINDER, Letchworth Village and Columbia University.
- The Rorschach Method as a Diagnostic Aid in Organic Disturbances of the Central Nervous System.* ZYGMUNT PIOTROWSKI, Columbia University.

Significant Trends in Published Articles in the Field of Measurement.

EARL BENNETT SOUTH, New York State College for Teachers,
Albany.

GENERAL SESSION

CHAIRMAN, K. S. LASHLEY, HARVARD UNIVERSITY

Methods, Techniques, and Conclusions in Contemporary Abnormal Psychology. CARNEY LANDIS, Columbia University.

Three-minute comments from the floor by W. S. Taylor, Smith College; P. M. Symonds, Teachers College, Columbia University.

Recent Statistical Advances and Their Applications in Psychology.

JACK DUNLAP, University of Rochester.

Three-minute comments from the floor by Quinn McNemar, Fordham University; Albert Kurtz, Life Insurance Sales Research Bureau.

Present Status of Research on Brain Potentials. GEORGE KREEZER, Vineland Training School.

Three-minute comments from the floor by Carlyle Jacobsen, Cornell Medical School; Louis W. Max, New York University.

In conjunction with these sessions the following groups met: Board of Affiliates of the American Association of Applied Psychologists; Psychologists' Committee of the Medical Bureau to Aid Spanish Democracy; Association of Consulting Psychologists; and the Society for the Psychological Study of Social Issues.

PROCEEDINGS OF THE THIRTEENTH ANNUAL
MEETING OF THE MIDWESTERN
PSYCHOLOGICAL ASSOCIATION

J. P. GUILFORD, SECRETARY, UNIVERSITY OF NEBRASKA

The Thirteenth Annual Meeting of the Midwestern Psychological Association was held at the University of Wisconsin, Madison, Wisconsin, on Friday and Saturday, April 22 and 23, 1938. The register was signed by 199 members and 215 visitors, bringing the known attendance to 414. A special feature of the meeting was the celebration, with the department of psychology at the University of Wisconsin, of the fiftieth anniversary of the founding of its psychological laboratory by Joseph Jastrow in 1888.

At the annual business meeting, held on Friday evening, 48 new members were elected, bringing the present membership to 480. It was voted to publish abstracts of papers read at the annual meeting in the *PSYCHOLOGICAL BULLETIN* beginning in 1939. Resolutions were proposed and passed by a vote of 31 to 24 protesting the holding of the Twelfth International Congress of Psychology in Vienna in 1941. It was announced that the next annual meeting of the Association will be held at the University of Nebraska, Lincoln, Nebraska, May 5 and 6, 1939. The following newly elected officers of the Association were announced:

President, 1938-1939: Edmund S. Conklin, Indiana University.
Council Member, 1938-1941: E. A. Culler, University of Illinois.
Council Member, 1938-1940, to complete the unexpired term of
E. S. Conklin: Sidney L. Pressey, Ohio State University.

PROGRAM

FRIDAY MORNING, APRIL 22

SESSION A. SOCIAL BEHAVIOR

CHAIRMAN, A. G. BILLS, UNIVERSITY OF CINCINNATI

Nationality Preferences and Stereotypes of Colored Children. H.
MELTZER, Psychological Service Center, St. Louis.

Quantitative Analysis of Group Opinion on Socioeconomic Questions.
ROSS STAGNER, University of Akron.

The Ability to Judge Crimes by Inspection of Photographs of Criminals: A Contribution to Technic. G. R. THORNTON, University of Nebraska.

An Experiment on the Effect of Autocratic and Democratic Atmosphere on Group Life. KURT LEWIN, Iowa Child Welfare Research Station.

Effect of the Collective and the Solitary Situations on Learning Performance. HERBERT GURNEE, Western Reserve University.

1. SYMPOSIUM ON OPERATIONISM

CHAIRMAN, R. H. WATERS, UNIVERSITY OF ARKANSAS

SESSION B. SENSATION AND PERCEPTION

CHAIRMAN, R. M. ELLIOTT, UNIVERSITY OF MINNESOTA

Estimation of Short Time Intervals—II. A. R. GILLILAND and R. F. MARTIN, Northwestern University.

Autokinetic Phenomena in Human Brain Cases with Hemianopsia. WARD C. HALSTEAD, Otho S. A. Sprague Institute and Division of Psychiatry, University of Chicago.

The Conditioned Reflex as a Psychometric Technique. LOUIS D. GOODFELLOW, Northwestern University.

Position of the Head and Response to Vestibular Stimulation. ROLAND C. TRAVIS, Western Reserve University.

A Comparison of Complementary Color Mixtures in the Cebus and Rhesus Monkey and in Man. WALTER F. GREETHER, University of Wisconsin.

Individual and Sex Differences in Solving the Disarranged Word Problem. S. S. SARGENT, Central Y.M.C.A. College, Chicago.

2. SYMPOSIUM ON LEARNING

CHAIRMAN, H. B. REED, FORT HAYS KANSAS STATE COLLEGE

SESSION C. AFFECTIVITY AND MOTIVATION

CHAIRMAN, PAUL THOMAS YOUNG, UNIVERSITY OF ILLINOIS

Changes in the Emotional Suggestiveness of Musical Phrases Subjected to Progressive Modification. MELVIN RIGG, Oklahoma A. and M. College.

The Structure of Simple Composition: Relation of Single Element to Field. EDWARD N. BARNHART, Cleveland Museum of Art.

An Experimental Test of Freud's Doctrine Concerning the Relation of Hedonic Tone and Memory. AGNES ARMINDA SHARP, Rush Medical College and Psychiatric Institute of Municipal Court of Chicago.

A Study of Motivation Involving Self-announced Goals of Fifth Grade Children and the Concept of Level of Aspiration. HAROLD H. ANDERSON and H. F. BRANDT, University of Illinois and Drake University.

Estimating the Level of Vocational Aspiration. WALTER A. LURIE, Jewish Vocational Service and Employment Center, Chicago.

FRIDAY AFTERNOON, APRIL 22

1. SYMPOSIUM ON EXTRA-SENSORY PERCEPTION

CHAIRMAN, D. A. WORCESTER, UNIVERSITY OF NEBRASKA

SESSION A. ELECTROPHYSIOLOGY

CHAIRMAN, E. A. CULLER, UNIVERSITY OF ILLINOIS

The Relationship Between Initial Level of Muscular Tension and Time of Attaining a Supernormal Performance. G. L. FREEMAN, Northwestern University.

Temporal, Qualitative, and Quantitative Relationships of Muscle Responses to Variable Cortical Stimuli. P. S. SHURRAGER, University of Illinois.

Muscular Action Potentials During Mental Work in Relation to Difficulty and Frustration. R. C. DAVIS, Indiana University.

The Onset of Sleep. EDMUND JACOBSON, Laboratory for Clinical Physiology, Chicago.

An Experimental Study of Autonomic Activity in a Subject with 'Voluntary' Control of the Mm. Arrectores Pili. DONALD B. LINDSLEY and WILLIAM H. SASSAMAN, Associated Foundations and Laboratory of Anatomy, Western Reserve University.

Brain Potentials During Sleep: A Comparative Study of the Dominant Alpha and the Nondominant Alpha Groups. JOHN R.

KNOTT, CHARLES E. HENRY, and JOHN M. HADLEY, University of Iowa.

2. SYMPOSIUM ON PRINCIPLES OF DEVELOPMENT

CHAIRMAN, BETH L. WELLMAN, UNIVERSITY OF IOWA

SESSION B. MEMORY

CHAIRMAN, J. P. PORTER, OHIO UNIVERSITY

Testing the Law of Frequency by Means of Incidental Memory. R. W. HUSBAND, University of Wisconsin.

The Critical Significance of Studies of the Locus of Retroactive Inhibition for Theories of Retroactive Inhibition. ARTHUR W. MELTON, University of Missouri.

The Effect of Immediate Testing on Reminiscence in Substance Learning. A. L. EDWARDS and H. B. ENGLISH, Ohio State University.

Visual and Vocal Recognition Memory. HILDING B. CARLSON, Municipal Psychiatric Institute, Chicago.

The Temporal Course of Transfer in the Learning of Memory Material. M. E. BUNCH and V. G. McCRAVEN, Washington University.

3. SYMPOSIUM ON FIRST COURSE IN PSYCHOLOGY

CHAIRMAN, A. R. GILLILAND, NORTHWESTERN UNIVERSITY

SESSION C. PERSONALITY

CHAIRMAN, JOHN J. B. MORGAN, NORTHWESTERN UNIVERSITY

An Evaluation of the P. Q. (Personality Quotient) Test. WILLIAM A. THOMSON, Mooseheart Laboratory for Child Research and Carleton College, Northfield, Minn.

Ordinal Position as Related to Familial and Extrafamilial Adjustment. MAURICE H. KROUT, Chicago City Junior Colleges.

The Rorschach Test in Cases with Brain Lesions. HENRY BROSN, Division of Psychiatry and Otho S. A. Sprague Institute, University of Chicago.

The Relation of the Achievement of Mutual Friendships to a Variety of Social and Academic Criteria. J. E. JANNEY, Western College.

Interrelationships of Attitudes of Parents and Children. H. H. REMMERS and L. B. WHISLER, Purdue University.

Relationship Between Family Economic Status and Some Personality Traits of College Students. S. MINTZER, Central Y.M.C.A. College, Chicago.

Charles: A Case Study. W. H. THOMPSON, Municipal University of Omaha.

4. SYMPOSIUM ON CLIMATE AND HUMAN BEHAVIOR

CHAIRMAN, RAYMOND H. WHEELER, UNIVERSITY OF KANSAS

FRIDAY EVENING, APRIL 22

GOLDEN ANNIVERSARY DINNER

Honoring Dr. Joseph Jastrow and Dr. Clark L. Hull as guests of the department of psychology, University of Wisconsin, and celebrating the founding of the psychological laboratory by Dr. Joseph Jastrow.

Address: *Stages in the Progress of Psychology.* JOSEPH JASTROW.

Address: *Adventures in Psychological Theorizing.* CLARK L. HULL.

SATURDAY MORNING, APRIL 23

1. SYMPOSIUM ON FACTOR ANALYSIS

CHAIRMAN, H. O. GULLIKSEN, BOARD OF EXAMINATIONS,
UNIVERSITY OF CHICAGO

SESSION A. MENTAL DEVELOPMENT

CHAIRMAN, JOHN E. ANDERSON, UNIVERSITY OF MINNESOTA

Bodily Activity of the Human Fetus Under Normal Conditions.

T. W. RICHARDS, Samuel S. Fels Research Institute, Antioch College.

Relationship Between Fetal Activity Under Normal Conditions and Postnatal Performance at Six Months. HELEN NEWBERRY, Samuel S. Fels Research Institute, Antioch College.

Curves of Sleep Depth in the Newborn Infant. ISABELLE F. WAGNER, Ohio State University.

The Mental Development of Adopted Children Whose True Mothers Are Feeble-minded. MARIE SKODAK, Iowa Child Welfare Research Station.

The Mental Development of Children from Underprivileged Homes. HAROLD M. SKEELS and EVA A. FILLMORE, Iowa Child Welfare Research Station.

Intelligence of Preschool Children as Measured by the Merrill-Palmer Scale of Performance Tests. BETH L. WELLMAN, University of Iowa.

SESSION B. EDUCATIONAL PSYCHOLOGY

CHAIRMAN, H. H. REMMERS, PURDUE UNIVERSITY

An Evaluation of a Scout Leader's Training Program. HARRY K. EBY and FORREST A. KINGSBURY, Boy Scouts of America and University of Chicago.

The Unreliability of Monocular Photography in the Investigation of Reading. ELEROY L. STROMBERG, Oklahoma A. and M. College.

Speed vs. Comprehension in Reading as Conditioned by Level of Difficulty. MILES A. TINKER, University of Minnesota.

Verbal Ability and Improvement with Practice in Verbal Tests. HERBERT WOODROW, University of Illinois.

The Stephens College Vocabulary Tests. CARL N. REXROAD and WELDON P. SHOFSTALL, Stephens College.

SESSION C. CONDITIONED RESPONSE

CHAIRMAN, H. A. CARR, UNIVERSITY OF CHICAGO

Conditioning, Extinction, and Reconditioning of the Breathing and Flexion Responses in Dogs. E. L. WALKER, Indiana University.

Conditioning of the Electrical Response of the Cortex. LEE EDWARD TRAVIS and JAMES P. EGAN, University of Iowa.

Effects of Curare on Cortical Function in Dogs. E. A. CULLER, University of Illinois.

A Study of the Conditioned Flexion Response in Dogs with Special Reference to the Side of the Body Conditioned. W. N. KELLOGG, Indiana University.

2. SYMPOSIUM ON PERSONALITY ADJUSTMENT

CHAIRMAN, FRED MCKINNEY, UNIVERSITY OF MISSOURI

SATURDAY AFTERNOON, APRIL 23

1. SYMPOSIUM ON PSYCHOLOGY IN FAMILY RELATIONS

CHAIRMAN, THOMAS F. VANCE, IOWA STATE COLLEGE

SESSION A. APPLIED PSYCHOLOGY

CHAIRMAN, R. S. UHRBROCK, PROCTER & GAMBLE CO., CINCINNATI

Testing Weavers. WILLARD HARRELL, University of Illinois.*The Rôle of the Test Scoring Machine in Reducing Costs in Civil Service Examinations.* HERMAN A. COPELAND, International Business Machines Corporation.*The Predicability of Occupational Level from Intelligence.* R. S. BALL, Indiana University Medical Center.*The Reliability vs. the Validity of Test Scores.* H. A. CARR, University of Chicago.*Safety Education as the Mental Hygienist Sees It.* GILBERT J. RICH, Milwaukee County Mental Hygiene Clinic.*The Effect of Perfunctory and Cordial Rôles of the Tester upon the IQ of Convicts.* L. M. HANKS, JR., University of Illinois.

2. SYMPOSIUM ON CONTEMPORARY SOCIAL PROBLEMS

CHAIRMAN, ROSS STAGNER, UNIVERSITY OF AKRON

SESSION B. ANIMAL PSYCHOLOGY

CHAIRMAN, W. N. KELLOGG, INDIANA UNIVERSITY

The Effect of Early Inanition upon a Developmental Schedule and upon the Early Maze Performance of the Albino Rat. WILLIAM C. BIEL, Ohio State University.*The Rate of Approach to Satiation as an Index of Food Demand.* PAUL THOMAS YOUNG, University of Illinois.*A Primitive Form of Learning.* H. F. HARLOW, University of Wisconsin.*An Experimental Test of an Integrating Mechanism in the Reasoning of Rats.* NORMAN R. F. MAIER, University of Michigan.

Transfer and Cerebral Control in Rats. STANFORD C. ERICKSEN,
University of Chicago.

SESSION C. SPEECH

CHAIRMAN, LEE EDWARD TRAVIS, UNIVERSITY OF IOWA

Change of Voice in Male Adolescents. ELDON K. JEROME, Purdue
University.

*A Study of Aggressiveness in Normal and Defective-Speaking College
Students.* MILDRED TEMPLIN, Purdue University.

Speech of the Preschool Child. HARRIET O'SHEA and M. D. STEER,
Purdue University.

Auditory Factors in Functional Articulatory Speech Defects.
MARGARET E. HALL, University of Iowa.

*The Rôle of Visual Cues in the Precipitation of Moments of Stutter-
ing.* JAMES MADDOX, Purdue University.

REVIEW OF LABORATORY REPORTS

CHAIRMAN, HULSEY CASON, UNIVERSITY OF WISCONSIN

SATURDAY EVENING, APRIL 23

ANNUAL DINNER

TOASTMASTER, H. A. CARR, UNIVERSITY OF CHICAGO

Address of Welcome: V. A. C. HENMON, University of Wisconsin.

Address of the President: A. G. BILLS, University of Cincinnati.

Subject: Changing Views of Psychology as Science

A REPLY TO DR. DOOB'S COMMENTS CONCERNING THE PSYCHOLOGICAL CORPORATION

BY PAUL S. ACHILLES

Managing Director, The Psychological Corporation

Those immediately responsible for the management of the Psychological Corporation seek to use criticism constructively and to correct any false impressions of the organization which the criticism may create. It is this intention which prompts a reply to Dr. Doob's criticism of the Corporation published in the April, 1938, number of this journal.

For a clear understanding of the matter the general objects of the Corporation and the conditions governing its operation must be considered as well as the particular materials upon which Dr. Doob's comments were based. These materials consisted of an unpublished report of a survey made by the Market Research Division of the Corporation and a few statements under the caption "A Word of Explanation about the Psychological Corporation" mimeographed on its letterhead. Inasmuch as Dr. Doob cites no other sources of his information about the Corporation these materials apparently formed the sole ground of his attack.

Dr. Doob's chief charges against the Corporation are that it is biased in favor of so-called "big business" and that it tries to create a "scientific aroma" in order to promote its own prestige. The first of these is based on the unpublished report and the second on the mimeographed sheet, both mentioned above. We shall deal first with the charge of its trying to create a "scientific aroma."

The following statement is drawn from the Psychological Corporation's charter:

"The objects and powers of this corporation shall be the advancement of psychology and the promotion of the useful applications of psychology. It shall have power to enter into contracts for the execution of psychological work, to render expert services involving the application of psychology to educational, business, administrative and other problems, and to do all things, not inconsistent with the law under which this corporation is organized, to advance psychology and to promote its useful applications."

In further explanation of these aims Dr. James McKeen Cattell wrote at the time of the Corporation's founding: "So far as is

known, this is the first corporation organized under the provisions of the business corporation laws of any state whose objects are the advancement of science and whose earnings must be devoted to scientific research. There are, of course, membership and charitable corporations not for profit and exempt from taxation, but the Psychological Corporation proposes to earn by its services the money that it will use for psychological organization and research." The Corporation's stock is owned by some one hundred and seventy-five psychologists, many of whom are active in its work, and its charter provides that no dividend in excess of \$6.00 per share shall be paid in any calendar year and that the American Psychological Association may take over any or all of the stock on payment of \$100 per share.

It is necessary to present the foregoing facts concerning the Corporation both because Dr. Doob misrepresented them and because they indicate that to a large extent the so-called "scientific aroma" has existed from the time of the Corporation's founding. The single sheet of information about the Corporation from which Dr. Doob quoted in his article contains the following statement:

"The organization is strictly scientific and non-partisan, has no sales force to promote its work, and is non-profit making in that its earnings above \$6.00 a share (1000 shares) must be devoted to further psychological research."

In quoting from this statement Dr. Doob omitted all words after "non-profit making," thus creating a false impression as to the Corporation's objects and methods of operation. It is a business enterprise based on the simple premise that an organization of psychologists can develop, promote, and render services of economic value and thus earn fair remuneration and funds for research. This basis of free competitive enterprise under business corporation law was accepted by the Corporation's founders as preferable to conditions of subsidy for the testing and development of the practical uses of psychology. The operation of such an organization requires an active full-time staff which must perforce endeavor to present and sell such services as they and other psychologists cooperating with them can render.

Although the fact may be painful to some psychologists, the first requisite for such services is that they be sufficiently practical and useful to be saleable. Hence, by belittling such services as "almost worthless as a contribution to a systematic science," Dr. Doob again overlooks the objects and requirements of the Corporation and does

little good to the cause of enlarging the opportunities for psychologists to become self-supporting by services other than subsidized research or teaching. In the long run, evidence of the usefulness of a science is one of the most essential contributions that can be made to it and experiments to that end have a rightful place along with so-called "pure" research.

With regard to the unpublished study which formed the basis of Dr. Doob's charge of bias in favor of "big business" on the part of the Corporation, it may be said, first, that the study was "experimental" in the above sense.

With the coöperation of some one hundred or more psychologists throughout the country the Market Research Division of the Corporation, headed by Dr. Henry C. Link, conducts what are termed market research or consumer studies. These involve careful preparation and pretesting of the questions to be asked as well as careful instructions to the students selected by the psychologists to make the personal interviews. Some of these studies are done on a commercial basis with remuneration to the psychologists and students participating. Others are done without remuneration and are termed "experimental" in the sense of testing out and improving methods, and in the sense of discovering possible lines of investigation of sufficient value to business firms to warrant their retaining the services of the Corporation. In other words, the Corporation frankly endeavors to furnish business firms, big or little, with evidence that the services of psychologists are of economic value.

Upon the completion of an unpaid "experimental" study of the above nature having to do with public attitudes on various controversial questions, interpretative comments were drawn by Dr. Link, and mimeographed copies of the report and comments were then sent to all of the psychologists who had participated in the study and also to some of the Corporation's clients and a few other executives who might be interested. In the latter instances where the Corporation was unknown "A Word of Explanation about the Psychological Corporation" was also enclosed.

Psychologists should be the first to admit their own biases and there is no denying that the comments first drawn by Dr. Link in this study revealed his biases just as comments drawn by anyone else might reveal other biases. Dr. Doob made no mention of the fact that the report gave the questions and data in full so that anyone might make other interpretations than those suggested by Dr. Link.

Furthermore, had Dr. Doob investigated further he would have found that practically all of the interpretative comments to which he objects were either deleted or modified when this study was given formal publication in the October, 1937, *Journal of Applied Psychology*. These changes, it may be remarked, were made as a direct result of criticisms of the privately circulated report made by the Research Associates of the Corporation in response to a routine request for criticism. Dr. Doob might still find fault with this publicly printed report, but no fair observer could fail to see its great progress toward unbiased interpretation of the data. Furthermore, the Corporation has never sold services of any nature to any client as a means of finding facts or opinions favorable to the client.

The Corporation's staff lays no claim to immunity from biases or from making mistakes. From the nature of the objects and conditions governing operation of the Corporation they are more than ordinarily open to criticism, inasmuch as they have to meet commercial standards on the one hand and scientific psychological standards on the other. For the balancing of biases there are now 10 psychologists with Ph.D.'s on the staff and 5 with M.A.'s, not to mention some two hundred psychologists who have voluntarily applied in 1938 to be listed as Research Associates of the Corporation. In so far as such a Corporation may be said to have a bias it is contained in its charter establishing it as a business organization under the American system of free enterprise.

REJOINDER TO HOLZINGER'S REPLY TO
SPECIAL REVIEW OF 'TWINS'

BY QUINN McNEMAR

Fordham University

In the July number of this journal there is a reply by Professor Holzinger to my special review of 'Twins,'¹ which appeared in the April number. A part of the reply is enlightening, a part indicates a failure to grasp the intended meaning or the significance of certain criticisms, and some statements occur which the reviewer considers inaccurate.

Professor Holzinger calls attention to the fact that the h^2 values in Tables 37 and 95 should not agree exactly as was erroneously assumed by the reviewer. This happens not to be related to any of my criticisms. Also the reviewer is glad to be informed that the use of probable errors of means is warranted with J-shaped distributions.

In reply to the comment that selective factors might be present because "fraternal twins which are least alike physically and mentally are most apt to be overlooked when twins are being located," we are told that mothers, teachers, and the twins themselves get wind of the fact that twins are twins even though they do not look alike. Presumably the twins were not located by making inquiry of mothers or the twins themselves(!), so we conclude that teachers played a large part in finding the twins. Now Holzinger ignores the important "and mentally" in the above quotation, so the reviewer is pushed back to his original contention that no evidence is available to show that selection did not take place. Need it be said that those who are mentally least alike will be the farthest separated in grade location and therefore most apt to be overlooked by teachers? My own experience in locating twins leads me to believe that this type of selective factor cannot be ignored.

Is it sufficient to know that "*practically* all of both types of twins were diagnosed without knowledge of the physical measures" (p. 437, Professor Holzinger's reply; *italics mine*)? Surely a fundamental working postulate is that the variables used in diagnosing

¹ Newman, H. H., Freeman, F. N., and Holzinger, K. J., *Twins: A Study of Heredity and Environment*. Chicago: The University of Chicago Press, 1937. Pp. xvi+369.

monozygosity must be strictly independent of the variables to be used in later resemblance comparisons. Incidentally, composite physical differences were utilized in 13 doubtful cases (p. 65, "Twins"), not in 3 cases as stated on page 437 of the reply.

As an example of a criticism "without much point," Holzinger cites (and accepts as true) my comment that "In general, corrections for errors of measurement will raise h^2 about .10 in the case of mental traits and only about .01 in the case of physical traits." This happens to be so pointed as to invalidate the authors' conclusion (questionable also on other grounds) regarding the greater importance of heredity for physical as compared to mental traits. The h^2 values, corrected for age and range, for 6 physical traits are .82, .75, .79, .78, .66, and .61, and for 4 intelligence measures, .68, .70, .75, and .79. Adding .01 to the first group and .10 to the second group makes it impossible to say that the first set is higher than the second.

We disagree as to the number of correlations in Table 93 which are 3 times their standard errors. Holzinger finds 7 such values. My count of 2 was based on the s -transformation. For $N=19$, we have $\sigma_s=.25$; 3 times this leads to a s -value of .75 which corresponds to an r of .635, and only 2 r 's in the table exceed this value. As a further check, let us refer to the method used by Holzinger himself in the twin book for evaluating the r 's in Table 93, *i.e.* to Fisher's Table V.A. From this and Student's distribution of t we deduce that for 17 degrees of freedom, t must be approximately 3.36 to carry the same significance as an x/σ of 3, and that r must approximate .63 for a t of 3.36. Apparently Holzinger, though using a modern method in the twin book, has based his count upon an antiquated standard error formula.

It is stated in the reply that the reviewer "does not say how he corrects for range." Holzinger's computer 'discovered' that Kelley's formula, which was invented for another purpose, *i.e.* adjusting reliability coefficients for range, was used. This happens not to be true; furthermore the reviewer did state how he corrected for range (see middle p. 247, review). Since the σ_D^2 values were available, the effect of range was taken into account by using one σ^2 in the formula for r involving difference variance and trait variance. We arbitrarily chose the trait variance for fraternal as σ^2 .

On page 443 of the reply one finds differences in r 's for separated *vs.* identical twins which are 2.19, 1.42, and 1.76 times their standard errors. It is surprising to find Holzinger regarding this consistency

as bolstering his claim of a significant difference between the 2 types of twins. Why wouldn't such highly correlated variables as Binet MA, Binet IQ, and Otis IQ tend to give consistent results on the same 2 samples, and what does that have to do with what would happen if other samples were drawn, which is the real point at issue? A mere duplication in measurement does not decrease sampling errors.

We cannot agree with Holzinger's claim that more valid home ratings would have resulted if all the raters had been acquainted with the twins (and the measurements). Just how this would lead to better ratings of environmental differences is a mystery, whereas knowledge of the twins could, consciously or unconsciously, lead to biased ratings which would tend to produce correlation between rated differences in environment and intrapair trait differences. We did not claim that raters were influenced by the measurements—we only implied that such a thing is not unheard of.

Some three pages of the reply are devoted to the proposition that corrections to h^2 for range are negligible. The reviewer had discovered this, hence his criticisms regarding the effect of range (and age) were not directed at the influence upon h^2 , but only at the resemblance coefficients in Table 96. We insist that these values are most misleading and that not one of the authors' deductions therefrom is valid unless we accept an uncommonly low criterion of significance.

As just indicated, we differ in our concept of what constitutes statistical significance. It may be a matter of opinion as to whether a difference should be twice or thrice its standard error, but it is not opinion that the acceptance of the lower standard is made at the expense of the degree of confidence with which positive conclusions can be drawn. In view of the paucity of information regarding the adequacy of sampling techniques (such as we have) in the fields of psychology and education, it seems to the writer that conclusions which have far-reaching educational and social implications should be based upon the higher standard.

The reviewer is not willing to concede that any of the points mentioned in the reply as being matters of opinion are really such with the exception of the point concerning statistical significance. Furthermore, the reviewer is inclined to think that the critical reader will agree with him that, except for the inquiry raised about the use of probable errors with J-shaped distributions, Professor Holzinger has in no sense provided adequate answers for any of the original criticisms set forth in the special review.

A FURTHER NOTE ON CITATIONS TO SCIENTIFIC LITERATURE

BY FLORENCE M. TEAGARDEN

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Dr. English's *On Citations to Scientific Literature* in the May, 1938, *PSYCHOLOGICAL BULLETIN* calls for a hearty vote of approval from all those who have occasion to do bibliographical work in psychology. Would that there were some way to publicize this article until it had reached the remotest corners from which any further publications would ever be likely to emanate. May we, however, go one step further? I refer to the unwarranted and unjustifiable way in which proper names are tampered with. For purely personal reasons one person may prefer to sign himself *John W. Doe* while another may, for reasons best known to himself, prefer to use initials only and be known as *G. B. Doe*. We cannot perhaps argue with the latter that he may lose some identity by submerging his Christian name—he may *even* be confused with a woman by so doing! We can perhaps ask that both of the above Does adopt a way of signing their names and stick to it. My greatest complaint, however, is against reviewers and authors who take the liberty of using initials in reporting a proper name when the author himself has used his own full name. The *PSYCHOLOGICAL ABSTRACTS*, for example, to cite one instance, feels that in the interest of economy *H. F. Hooker* is better than *Helen F. Hooker*. Economy is less of a virtue, perhaps, than accuracy when the contraction leads again and again to subsequent references to what Hooker found when *he* made *his* study, etc.! The assumption seems to be that when 2 initials are used the writer is a male. Furthermore, work is even attributed to the wrong author occasionally (instances could be named) where, for example, *Henry Ross Smith* and *Harriette Rachel Smith* both become *H. R. Smith* when initials only are used. We might add, therefore, to Dr. English's recommendations cited above 2 further suggestions: (1) that authors use at least one Christian name in the interest of accurate identification of authorship, and (2) that reviewers, abstractors, and all others who refer to publications use the name as given by its owner.

BOOK REVIEWS

RÉVÉSZ, G., *Die Formenwelt des Tastsinnes*. Haag: Martinus Nijhoff, 1938. Volume I: *Grundlegung der Haptik und der Blindenpsychologie*. Pp. xii+291. Volume II: *Formästhetik und Plastik der Blinden*. Pp. x+293.

This may for several reasons be considered a pioneer work. There are, it is true, a number of good books on the psychology of the blind; there have also been comprehensive studies of the world of touch; and from time to time we find psychologists turning their attention to problems of aesthetics. This is the first time, however, that a psychologist of established reputation has systematically and experimentally studied the form perception and form production of the blind, and has interpreted his findings in terms of aesthetic theory and of the theory of space perception. It is a rich field, and Professor Révész has succeeded magnificently in clearing the ground and in reaping a first crop. The book is clearly written and generously illustrated. It merits the attention of students of the psychology of perception, of aestheticians, and of those who are directly interested in understanding the world of the blind.

Current perceptual theory has tended to dismiss as a pseudo problem the old question as to how much the various senses contribute to the structure and organization of the phenomenal world. The senses are not separate storehouses, and perceptual experience is not a composite. It is intelligible, although perhaps somewhat unfortunate, that in our restatement of perceptual problems we have thought almost exclusively in terms of visual concepts. It is true that the phenomenal world is for most of us predominantly visual; but we are still justified in asking how the world would appear if we were deprived of our visual apparatus. This is the question which Professor Révész has revived. In attempting to answer it he has explored the literature of the psychology of blindness; has studied the reports of those cases in which sight has been restored through operation; has performed experiments on blindfolded subjects with normal vision, on subjects who have lost their sight late in life, and on subjects who have been blind from birth; and has investigated all available cases of blind sculpture. This last aspect of the investi-

gation, to which most of the second volume is devoted, is perhaps the most illuminating part of the whole study, and raises important problems both for psychology and for aesthetics.

Those who have derived from the writings of such literary artists as Helen Keller a somewhat romanticized picture of the world of the blind may find the general conclusions a trifle shocking. There is, Révész contends, an autochthonous haptic space; but its organization is so poor and its structure is so unstable that it cannot be considered as parallel to the space of vision. The person who has been blind from birth can apprehend objects as such, and can by progressive steps relate parts together so that they finally constitute an organized structure, but he can never on the basis of haptic sensitivity alone achieve any high degree of articulation. The direct perception of form is possible, but it is limited by the compass of the perceiving hand, and it is highly unreliable. When complex objects, such as busts, were presented, the subjects explored them part by part, and finally made guesses as to the nature of the objects. It is significant that these guesses seldom agreed either with each other or with the perceptions of seeing subjects.

When we discover how impoverished the perceptual world of the blind is, we are naturally led to wonder about the amazing technical and artistic achievements of blind people which are so frequently reported. Two facts are to be noted in this connection. In the first place, a great many people who are reputedly blind are either not totally blind or have lost their sight after some years of visual training. The first can, of course, be ignored. In his studies of the second group, Révész found that such achievements were almost invariably rendered possible by the carefully preserved remnants of previous visual experience. In the second place, the apparently artistic productions of the blind usually fall far below the accepted standards of aesthetic excellence. The blind sculptor, for instance, may master a given technique, possibly that of carving crucifixes, and may, by following the same stereotyped procedure, continue to produce crucifixes; but they are usually faulty in detail and lacking in expression. Are we to conclude, then, that there is no purely haptic aesthetics? Révész gives his answer tentatively in the affirmative, not because the blind person is fundamentally lacking in aesthetic sensitivity—the creations of blind composers show no such defect—but because the world of touch does not provide the basic material necessary for aesthetic appreciation. That the limitations of the world of touch cannot be transcended, however, Révész would not assert. Among

the blind sculptors whom he investigated he found one—but only one, the Italian, Masuelli—who seemed to him to meet the requirements of artistic excellence. Here, however, the problem becomes one of aesthetics rather than of psychology.

It is a pleasure to report that the book is not designed to be used as a text. It is a serious piece of scientific work, written on an adult level, and it represents one more step in the direction of an adequate psychology of perception.

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Swarthmore College.

VALENTINE, WILLARD L., *Experimental Foundations of General Psychology*. New York: Farrar and Rinehart, Inc., 1938. Pp. xvii+377.

This book is designed primarily to supplement a general text in the introductory course in psychology by presenting to the student short, critical reviews of representative experiments in language comprehensible to the average beginner. Dr. Valentine has attempted to provide "some insight into how a psychologist goes about collecting the information he needs and what he does after he collects it." At the same time he has sought to drive home to the beginner the significance of scientific method as applied to human behavior.

The book consists of nineteen chapters, a listing of which will give a good idea of the scope of the work. They are: (1) "The Nature of the Psychological Experiment"; (2) "Phrenology, Physiology, Graphology, and Character Analysis"; (3) "Inheritance"; (4) "Maturation and Growth"; (5) "Physiological Conditions"; (6) "Drives and Motives"; (7) "Market Research"; (8) "Hypnosis and Suggestibility"; (9) "The Development of Emotional Behavior"; (10) "Emotion in Adults"; (11) "Conflict"; (12) "Perceptual Behavior"; (13) "Learning"; (14) "Remembering"; (15) "Reasoning"; (16) "Learning, Thinking, Imagining, Dreaming, and the Brain"; (17) "Intelligence"; (18) "The Meaning of Intelligence Test Scores"; (19) "Aptitudes." Each chapter is subdivided into from two to nine subtopics and each of these comprises one or more critical abstracts of significant experiments. The chapters are opened with a paragraph of orientation and are terminated with an interpretative summary of the results of the experiments described.

In the reviewer's opinion, Dr. Valentine has very successfully executed the task which he set for himself. The book is clearly and

interestingly written and the average sophomore will undoubtedly take to it. It smoothly introduces the student to the actual mechanics of research in psychology and should go far toward instilling something like a critical attitude—results which the average general text seldom accomplishes.

If the reviewer has any criticism to offer, it would pertain to the choice of subject-matter. The absence of any material on sensory processes and the very limited references to the field of perception seems to be rather unfortunate. No doubt Dr. Valentine avoided these subjects because of their technical nature and because "they remain incomprehensible to the beginner even though the instructor may labor valiantly to point out their significance." But it is precisely for this latter reason, at least, that the reviewer would wish to see these subjects treated in such a book as this. The subject-matter which is ordinarily called practical and to which a large portion of the book is devoted is usually of sufficient inherent interest to be easily presented by the average instructor; whereas, the less practical phases of psychology which the student usually finds so tiresome might be presented much more successfully through the medium of Dr. Valentine's clear and interesting style. However, this criticism, if it is one, represents a personal bias of the reviewer which seems to be less popular now than it once was, and doubtless the majority of teachers of beginning courses will find it of little weight. To these, in particular, the book should prove a valuable teaching aid.

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RUCH, FLOYD L., and WARREN, NEIL, *Working with Psychology*. New York: Scott, Foresman and Company, 1938. Pp. ix+214.

This workbook, designed to accompany *Psychology and Life* by Floyd Ruch, contains a very thorough and comprehensive treatment of the textbook material. It accomplishes this by the use of three methods: a self-testing series of questions, group demonstrations and experiments, and discussion questions and topics. Each of the eighteen chapters of the textbook has a corresponding exercise made up of the three sections as described above. Each exercise is preceded by a background bibliography of textbooks and readings. Though these exercises are derived from the *Psychology and Life* textbook, and very adequately cover that material, the authors intend that the book may be "employed in conjunction with any standard

introductory textbook by making suitable changes in minor points." It is difficult to see how this can be accomplished since the self-testing questions, the answers to which the student is to look up, and to a lesser degree the group experiments and discussion sections, are much more specifically attached to the text material than the statement above would imply. The first self-testing question of the book follows: "Human psychology is that science which seeks to understand the . . . , and . . . of people in order that they may better . . . and . . . their own lives and more effectively . . . those of others." It is conceivable that the student would have to do considerable research to complete this statement without recourse to *Psychology and Life*! The self-testing questions are of the completion, multiple choice, and true-false type and some thirty-five or forty questions are devoted to each textbook chapter. It is suggested that if a textbook other than *Psychology and Life* is used "several of the standard texts referred to (in the bibliographies) be made available to permit students to employ the self-tests as study projects." Without any basis of actual experience in using this book the reviewer is inclined to believe that such a procedure would involve too much of the student's time to make it worthwhile.

The second section of each chapter exercise—group demonstrations and experiments—is perhaps the most useful for courses which have demonstration sections. No laboratory setups or supplies are required. The data sheets, forms, cancellation tests, etc. are included. This section, as well as the self-test section of each exercise, has space for name and date, and since the book is of the loose-leaf paper variety these exercises may be torn from the book and handed in. The most striking thing about the demonstration materials is that the student who performs all the tasks set by the book will quite "painlessly" and almost without awareness of the fact become acquainted with the elementary methodology of the various fields of psychology stressed in the text. It should be noted that the preference for certain techniques over others follows the point of view developed in the textbook, and certain aspects of psychology which are thought to be unimportant from the standpoint of the student's interests are excluded. For example, no maze demonstrations are included, but problem-solving and reasoning are given adequate treatment.

The third section of each exercise is made up of statements and questions which form the basis for discussion or written work. The attempt has been made to apply the text material to the life situations of the student, or in other ways to remove it from the text setting.

These " suggestions for application and discussion " are very cleverly formulated and should foster lively discussion groups. They should also, under proper discussion leadership, acquaint the student with the significance of psychology in his own life.

The student who actually covers all the material in the workbook will undoubtedly have learned the text material, general methodology, and the significance of both to himself and others. There is no doubt that use of this book in conjunction with *Psychology and Life* is well worthwhile, but it is doubtful whether most elementary courses have either the time or the facilities to check the answers to the self-testing questions, to administer the group studies and correct them, and to read, lead, or grade the discussions. The reviewer would have appreciated it had the authors indicated in their preface just how the administrative details demanded by the use of the workbook can be adjusted to the normal time limits and facilities of an elementary course. If it is found that this latter criticism is not important it is not likely that a better treatment of *Psychology and Life* will be desired.

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TOOPS, H. A., and HAVEN, S. E., *Psychology and the Motorist*. Columbus, Ohio: R. G. Adams and Company, 1938. Pp. vi+265.

The authors questioned " What is the truth of the report that some thirty-nine thousand Americans annually are killed by the auto "; they also desired to learn " What is wrong with the auto ;—with the roads . . . ;—or with the drivers, drunken or sober." They could not find the answer in the published writings of the experts; hence, they set out to learn for themselves. They list fourteen sources of information, among which are newspaper clippings; inspection of parked cars for evidence of damage; stenotyped records of traffic court proceedings broadcast on the radio; inspection of cars in junk yards; and personal interviews with traffic victims or their families, with attendants at service stations, with garage mechanics, with members of the staffs of hospitals, with nondriving pedestrians, and with drivers who had been fined in traffic court. A part of the information was collected by students in formally planned interviews with drivers. Thus, a large part of their evidence consists of questionnaire material. The book presents an informal summary of their personal impressions arising out of the evidence. It is written joyfully, lightly, and loosely, as if much of it had been dictated at odd times

to a phonograph or to a stenographer who did not read back her notes; hence, one often has to select widely scattered sentences and assemble them for one's self in order to derive the authors' views about a particular topic.

Among the facts which the authors thus discovered, independently of all earlier authorities, are the following: (1) that the safety movement is infested by racketeers, each having some special gadget or service to sell at a high profit, and taking advantage of our emotional attitudes toward accidents to overcome our reason; (2) that among the propagandists for safety are many evangelists, who know little about human causes of accidents, who disregard the fact that the information that is now available does not yield a valid conclusion about many important questions for which they offer guaranteed answers, and whose defense is that if one doubts the soundness or the effectiveness of their propaganda one must believe in accidents; (3) that public records of accidents and violations are very poor, the information being often trivial, always incomplete, and in many respects inaccurate; (4) that the statistical procedures which public servants usually employ will not bring out some important facts that are latent in the actual records; (5) that nationwide statistics are to be taken with many mental reservations; (6) that driver examinations as now conducted do not eliminate the incompetent; (7) that traffic courts and the licensing of administrators do not re-educate accident makers and traffic offenders as they should; (8) that the designers of automobile bodies could make the modern car a less dangerous weapon than it is; (9) that certain "driver-clinicians" have misled the public as to the significance and importance of certain personal traits, especially reaction time; (10) that many newspaper campaigns against traffic offenders and dangerous driving practices, sponsored by safety organizations, lunch-clubs, and the like, are ineffective, being planned for news value and prestige rather than for any important social effects. All these things are true, and many intelligent persons holding responsible positions appreciated their truth before this book appeared.

Some of their other convictions arising out of their study are less plausible. I shall mention but one. "Do we need flood lighting on country highways? The answer . . . can be had by taking a night trip into the country . . . observing carefully your own behavior as you drive along. Do you halt for minor country roads? The answer is that . . . at night one never halts. Cars at that time . . . can be perceived by . . . their headlights for a quarter of a mile in open

country. *Also, most people go at least ten miles per hour slower at this hour.* The conclusion then is that the only place we need such lighting is at the sharp turns" (p. 118; italics mine). Although the lamp manufacturers and the public service companies are at least willing to sell to the state some equipment and service that it may not desperately need, so that we ought to examine, supplement, and perhaps replace some of the conclusions which they offer, I cannot accept unquestioningly the belief that these problems of highway lighting can be solved by an ordinary person through meditation over his experiences of an evening's drive into the country. In fact, some of these problems would be cheaply solved if they cost no more than half a million dollars and the services of a staff of experts for several years.

The authors make some constructive recommendations about traffic regulations, record-keeping, and accident statistics which disappoint me. With respect to the last two items, the senior author is well known as an expert, and most of our states could profitably listen to some technical advice which he is capable of giving. But there are reasons for the present deplorable records in our state bureaus which do not imply that all our public servants are incompetent or too stupid to do better. The types of report of individual accidents which these authors recommend are essentially *responses to questionnaires*, like the present types. After an accident, the drivers cannot well recall some details, for they never knew them when they occurred. Also, they are strongly motivated to forget everything that might hurt them in a damage suit, impair their insurance, or prejudice a magistrate against them, and to invent whatever facts they may need for justifying themselves. Hence, with respect to some important points, a report of an accident is worthless unless it is based on a thorough investigation made by a technically competent and disinterested outsider. Nor will the truth necessarily emerge from conflicting testimony of the participants, for each of them may have lied. If the original reports are thus infected, one cannot purify them by fancy statistical treatment; and some inexperienced political officeholders know better than to try.

If we really wish to have traffic regulated, facts gathered and interpreted, and accidents reduced, we must wait until drivers have learned to govern themselves, to assume some responsibility for the safety of all whom they may pass or meet, and to analyze their own behavior truthfully and impersonally; otherwise, we must establish a heavy and well-trained police force. Neither laws, administrative

edicts, signs and signals, or propaganda will avail us unless we set up the enforcement machinery. Recently, the Chief of the Division of Transport of the U. S. Bureau of Public Roads presented a very careful analysis¹ of the steps necessary for effective highway regulation, and estimated the cost, for operation alone, to be \$169,000,000 to \$366,200,000 a year, according as minimum standards or modest standards are considered. Our notions of regulation and of fact-finding should be framed with these realities in mind. Although the higher estimate requires less than fifteen dollars per registered vehicle per annum, I question whether our American drivers are yet willing to spend it, and also to submit to the restrictions that are necessary to make our highways reasonably safe.

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FROLOV, Y. P., *Pavlov and His School: The Theory of Conditioned Reflexes*. New York: Oxford University Press, 1937. Pp. xix+291.

In his *Foreword* Frolov confesses, "It is difficult to finish and edit a book on Pavlov, on his work, his school and his remarkable personality, just at the moment of the rupture of all those powerful bonds which have been established during twenty-three years' contact with him." The product of Frolov's labors is testimony to the difficulty of the task. Worship of Pavlov and the unquestioning acceptance of his scientific authority have resulted in a portrayal which does not add to an understanding of his real greatness, for it is overdone. Furthermore, in his anxiety to reach many audiences, Frolov has confused his presentation so that it can satisfy few. He has written to reach down to a non-technically-trained audience, but much of his subject-matter is likely to hold slight interest for such.

The book has at least two values, the first of which is for the student of conditioned reflexes. As the subtitle indicates, the present status of facts and theories coming from Pavlov's laboratory is presented. Six of the eight chapters are devoted to this. They serve as a necessary supplement to Pavlov's two previous books which have been translated into English. Important additions of material beyond

¹ James, E. W., Accident Records and Traffic Regulation. *Proc. Highway Research Board, 17th Annual Meeting*, pp. 435-443. Washington: National Research Council, 1938.

the contents of those two previous books are discussions of the mechanism of voluntary action, of Pavlov's new theory of two different cortical systems (one consisting of centers for the formation of conditioned reflexes, and the other, located primarily in the frontal lobes, accounting for abstract thinking), of Pavlov's attitude toward Freudian psychoanalysis, of relatively recent experiments with chimpanzees, and of Pavlov's interest, in the last years of his life, in the extension of his theories to the study of mental disease in man.

The second value is in the portrayal of Pavlov's scientific development, his habits, and his personality, as seen through the eyes of his students. This portrayal gives one an insight into the possible reason why Pavlov's more than two hundred students in the field of conditioned reflexes have produced so little that was original with them. Frolov's whole book is colored by the dominating influence of Pavlov's personality; even the expository portions reveal an undiluted and uncritical admiration for anything pertaining to the man or his work. Sechenov's *Reflexes of the Brain* is credited with being the main determiner of Pavlov's neurophysiological interests. Pavlov's contemporary, Bechterev, is not mentioned.

Frolov apparently hoped to reach not only the intelligent layman, but also the specialist, and addressed himself particularly to American psychologists. His method of attracting the attention of psychologists is a novel one: it is to abuse them. Köhler and Lashley and the Behaviorists are particular targets for numerous dead cats, but slighting references to everything connected with psychology are scattered through the book. Unfortunately, Professor Frolov's comments reflect the same ignorance of non-Russian scientific writings as characterizes our acquaintanceship with scientific developments in the U. S. S. R. He appears to be almost wholly ignorant of anything that has happened in psychology since the days of Pavlov's youth, with the result that his comments, made with an emotional tone, serve as unintentional comic relief in an otherwise serious text. From a few hints which Frolov gives (for instance, p. 16, "This analytical approach of behaviorism to the multifarious manifestations of life, this cult of figures, is of course closely bound up with the whole structure of American life.") one is tempted to conclude that he perhaps regards capitalist science as not worth any considerable study. Soviet science is abundantly praised.

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LANGER, SUSANNE K., *An Introduction to Symbolic Logic*. Boston: Houghton Mifflin Company, 1937. Pp. 363.

Howsoever closely logic books may be confined to special forms of thinking, they are still of unique importance to psychologists because of the paucity of other studies on this subject. No apology is therefore required for giving a book on logic and its general implications an extended notice in a psychological journal. Especially is this the case with symbolic logic, which is concerned not only with thinking, but also with language and symbology.

As the title implies, the present volume is an elementary treatise. It begins with a discussion of forms, proceeds to the essentials of logical structure and the problems of generalization, and then covers the subject of classes, their principles, relations, and deductive systems. This is followed by some chapters on the algebra of logic, abstraction, interpretation, and the calculus of propositions. The book ends with a brief introductory statement of Whitehead and Russell's *Principia Mathematica*, and the Nature of Logistics.

Though this book treats of symbolic logic (and what can be more abstract?), it is a thoroughly human book. This is true of both its conception and construction. Beginning with a most urbane acknowledgment of indebtedness to Professor Sheffer, the author proceeds by gradual steps from the particular to the general and only from this middle general position to abstractions. Moreover, every page teems with helps to the reader in the form of illustrations, while at the end of each chapter there are a summary, review questions, and exercise problems in an effort to carry out the promise of a fair journey, if not a royal road, from common sense to the abstruseness of logistics.

All praise then to the author for producing a stimulating and effective treatment of an intricate and increasingly popular intellectual enterprise. Since this is an extremely simplified text perhaps we should overlook the legerdemain by which the shapes of bread pudding, fruit jelly, or blancmange and the arrangement of musical sounds are transformed into pure symbolic form. For the same reason possibly we may condone the characterization of music as nonmaterial by a teacher of the most exact of disciplines.

But what about the subject itself? What is it that is made so easy to understand, and what is its general intellectual significance? These are not casual questions, inasmuch as it is claimed that symbolic logic is not only the basis of mathematics, which concerns all

scientific disciplines, but also is pregnant with immediate implications for biology and psychology. Woodger has already published several treatises on the axiomatic method in biology, while there are signs that some psychologists are also beginning to flirt with this discipline. Accordingly, while in estimating the doctrines of this book we do not forget its elementary character, we cannot fail to remember that we are, after all, concerned with a certain field of thought.

Basic to all logic and science, according to symbolic logicians, is structure. By means of proper symbolism we may faithfully copy the structure of facts (p. 55). They regard such symbolism as having great value in carrying out the scientist's dream to formalize all his facts in a completely deductive system. With such a system established, the scientist can derive any part of his facts from any other. What a colossal staticism!

Such a conception of logic and science obviously poses the question whether science is concerned with a fixed system of abstract entities which suffer no modification or development. That symbolic logicians can adhere to such a view is only possible because of their fervent belief that there is a permanent form of things. This form they reach by a process of abstraction which squeezes all content from phenomena. Naturally this can only be done by substituting symbols and propositions for things and events. The logician, then, deals only with "logical" structure and not with the structure of phenomena, with ultimate and abstracted relations and not with event coincidences. Symbolic logic is concerned, therefore, with symbols which incarnate the intangible relations of structure.

The explanation of this view is that symbolic logic is analogically derived from mathematics. Its beginning may be traced back to Leibniz's ideas of a Universal Characteristic and Rational Calculus which were founded upon the all powerful symbolism of numbers. Later Boole, the mathematician, developed a Calculus of Classes in the form of a numerical algebra. This became transformed by the work of Peirce, Jevons, and Schröder, and, when incorporated with the interests of Frege and Peano in the logical foundations of arithmetic, symbolic or mathematical logic was established.

Fundamental to symbolic logic is the conception that the power of mathematics presumably arises from its abstraction from things. Symbolic logicians repeat the statement that only when arithmetic, which already has abstracted from things, becomes itself abstracted into algebra has the reality of calculation been attained. This is without doubt a valid conception based upon the truth that mathe-

matics is a science of relations which can operate effectively only when these relations are analyzed out of their loci in concrete situations. But at once we must distinguish between certain operations performed for the purpose of manipulating phenomena or of handling them more implicitly and the simple attempt to reduce them to ultimate abstractions. These two types of operations illustrate the two phases of mathematics—the calculative and the arbitrarily systematic. It is only the former that is fruitful for science. What appears to be the subsequent application of capricious systems to physical or other phenomena actually consists of exhibiting the relevance of certain interconnecting relations to phenomena that can be made to elicit such relation systems. It is a special case when phenomena are arbitrarily thrown into an artificial set of relations to accommodate a mathematical structure.

To the psychologist who raises the question of the connection between logic and thinking, symbolic logicians answer that thinking is not a process of operating with things—thinking interbehavior—but a process of observing how elements of propositions or propositions themselves are arranged, so that one implies or reaches out to the other. Logic is not presumed to deal with thinking operations, but simply with the arrangement of objects of thought. The fact that all objects of thought, whether events, relations, or their representing symbols, have to be selected and otherwise derived by postulation is set aside in favor of observing immutable forms. Because symbolic logic seeks formal schemes of inference which hold equally for all subject-matter, it becomes reduced to a set of tautologies or games with arbitrary rules and conventional counters.

That symbolic logicians attempt to differentiate objective relations that are the objects of thought from thinking as subjective (psychological or epistemological) bespeaks nothing more than a cleaving to traditional or mentalistic psychology. The present author thus distinguishes between the *concept* of number and the *conception* by which it is conveyed to people (p. 313). The specific thinking technique here consists of associating psychic meanings with objective symbols. Psychological number activities are presumed to be casual and ephemeral, while logic is supposed to operate with absolute, formal relations. In the actual practice of the symbolic logicians the frank occupation with psychic elements is regarded as psychological, while objective logical activities constitute a surreptitious commerce with them. Though such distinctions and occupations were plausible

and justifiable under the rule of mentalistic psychology, modern objective psychology makes them anomalous.

For objective psychology all work, whether the concrete observation of psychological performance or the most rigid analyses of mathematics, is a definite interbehavioral operation. In the psychological situation the worker interbehaves with an organism's interbehavior with stimulus objects, while in the mathematical situation the worker interbehaves with various observed and contrived relations between things, whether planets, coins, points, or relations. In all cases we have nothing but concrete and natural operations. This is as true of the crudest manipulation of objects as of the most subtle calculations. The degree and remoteness of the operations depend entirely upon the materials operated with as well as the task the worker sets himself. If we are interested in natural phenomena our operations (including thinking, of course) are shaped by these phenomena, whereas if we are concerned with abstracted relations our operations can be more or less independent of the specific properties of things. The value of our abstractions in all cases will be firmly rooted in the circumstances of our work.

Abstractional operations can be carried on only with definite constructions made for certain purposes. These range from purely descriptive propositions through analytic and synthesizing formulae to the most abstruse logical systems. Even everyday verbal descriptions, whether vocal or graphic, constitute constructions derived from the interbehavior with original or secondary data and are thus interbehavioral phenomena or the results of such phenomena. Such results arise from contacts with indicators, pencil, paper, and other interbehavioral tools. Because descriptions are constructs they are abstractions from original phenomena and situations. When we come to scientific formulae our constructions are even more remote and abstract, in the degree depending upon the worker's problem.

Logicians who regard themselves as dealing with propositionally stated objective and independent relations concern themselves with things in disregard of the operations upon them. It is these neglected operations which are misinterpreted as meanings or other psychic entities. Actually such things consist of culturally built up and maintained accumulations of assumptions, knowledge, and techniques, so that the inevitable interbehavior is crudely concealed. Not that there are no humanly independent relations, but to work with them involves observational and experimental operations and not the mere examination of symbols and propositions.

Symbolic logicians have had to face this fact. We indicate two instances, of which the first is implication. Though striving for extreme formality and generality the symbolic logician cannot dispense with criteria such as those of truth and falsity which he uses for material implication. Defining "p implies q" as "p true and q false is in fact false," it follows that such propositions as "if anyone is just he is happy" and "if anyone is just he is unhappy" are both true when the hypothetical antecedents are false. The argument is that if there are no just men no one is just whether happy or unhappy. It is in line with the operational principle to make plain that the criteria of truth and falsity are merely conventional opposites. Similarly, the two paradoxical propositions which characterize material implication, viz., "a false proposition implies any proposition" and "a true proposition is implied by any proposition," bespeak a background of convention. All this means nothing less than going beyond the forms (verbal construction) and connections of propositions.

Another instance of the necessary rooting of symbols and propositions in natural or contrived relations is the idea of validity. The symbolic logician declares that only validity constitutes logical certainty. The author illustrates validity by deducing the correct conclusion: "America was discovered before A.D. 1500" from the premises: "Napoleon discovered America" and "Napoleon died before A.D. 1500." The consistency, when the concrete facts, except the time sequence, are abstracted from, is no different from the conventional truth of any set of propositions. This particular illustration, of course, is arbitrarily concerned with certain relations and not others. The distinction of truth, fact, and validity phenomena represents definite operations of a person with particular sorts of material.

So far as deductive thinking is concerned we may well agree that symbolic logic offers a clear improvement over the older purely verbal formal disciplines. The power which accrues to deductive processes from symbolic calculus is decidedly not a superfluity as Külpe thought (*Introduction to Philosophy*, 1897, Sec. 6). His mistake has become palpable by the developments in symbolic logic since his day. When Külpe criticized mathematical logic as simply a technique and not a theory of thought, he could not have been aware that all thinking and theory are techniques or interbehavioral operations with stimulus objects, whether concrete things or abstract propositions. It is precisely because symbolic logic follows the procedure of mathematics with its effective separation of relations from

related that it has become so important an operational instrument and practice.

We come then to the linguistic aspect of symbolic logic. Now while logic is presumed to deal with structure, with organization of forms, such a structure must be referred to or described. This means that language, either as symbols or propositions, becomes a central interest for symbolic logicians. Unfortunately symbolic logicians inevitably misconstrue the nature of language. Speech, especially its transcription, is confused with symbolism. In consequence so-called natural language is criticized as unfit for logical analysis. To make a point of the fact that the one word *is* constitutes a factor in six different referential patterns is to overlook the difference between the referential and symbolic interbehavioral activities. But a more serious error here is to confuse language with what it refers to or symbolizes. The procedure is to reduce language to form, so that it becomes identical with its formalized subject-matter. Philology is said to deal with the relations among words (p. 23) and syntax is simply the logical form of our language (p. 31). Again, it is asserted that the expression of relations is the chief purpose of language (p. 56) and that by refining symbolism logic can be brought out of language (p. 57).

Descriptions and other constructions, whether symbolic (mathematical) or verbal may be regarded as language phenomena. But language is never to be confused with the phenomena it refers to or describes. Because in mathematics we deal with originally abstract or abstracted relations we allow the description to absorb the things described. Thus, under the principle of exact and rigid description, symbolic representation of relations is made into Platonic ideas or patterns. While this procedure is no less intellectually harmful in mathematics than in physics, biology, or psychology, in the latter situations the resulting evil is much more apparent.

This confusion is excellently illustrated by the author's discussion of the value of logic for science (p. 333). When facing the contradictory statement that light is transmitted without an available transmission medium, it is declared that logic teaches us to reformulate the statement. "It is through such reformulations that the great insights of science are accomplished." What kind of science can be achieved by changing the verbal or symbolic description? We cannot agree with those who believe that scientific problems can be solved merely by avoiding contradictions in description rather than by exact observational and experimental operations. Granted that to describe

carefully and accurately is an essential prerequisite of science, the question still remains: whence is the description derived? Without accurate bookkeeping the business must fail, but without transactions of buying and selling no business exists at all.

Facilitating the distinction between describing language and described phenomena is the differentiation of referential language from symbology. Referential language is a set of activities for referring to things. But there are other sorts of interbehavior conventionally called linguistic; namely, those in which we set up marks or signs to symbolize things. Symbolizing operations may be regarded as less direct than speaking because of the employment of marks or signs as instruments. The act of speaking cannot be confused with the things spoken of, as symbols can. But we have only to observe that marks or signs are never the things they stand for or signify. If we respect the interbehavioral principle it is clear that their character as operational tools depends upon the aims and techniques of the operator. This point is obvious to every logician as evidenced by (1) his belief that every sign or symbol has a definite meaning, (2) his attempt to adopt the best symbology for particular sorts of system building, and (3) his rejection of such meaningless propositions as "2 is older than 3." It remains only to emphasize that meanings are not psychic additions to the marks, but the manner in which the marks are used; also, that systems themselves are phenomena in interbehavioral operational fields and not organizations of Platonic forms.

Let us be clear, then, that symbolic logic as a technique for building logical systems is a potent and valuable discipline. When, however, symbolic logicians imitate the members of religious sects by attempting to absorb all intellectual virtues and by promising all rewards we must withhold our assent. Practically all symbolinguists begin with the frank and agreeable assertion that logic is concerned only with coherent systems connecting granted premises and related conclusions. But since logical certainty implies pure abstractions arbitrarily set up, they begin to annex the essentials of concrete sciences. The result is not only fundamental and devastating paradox and contradiction resolvable only by hierarchies of autistic constructions, but also the nature of thinking, language, and science and their interrelations is hopelessly misinterpreted.

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EISENSON, JON, *The Psychology of Speech*. New York: F. S. Crofts and Company, 1938. Pp. xiii+280.

The author, well aware of the controversial nature of his topic and of the really boundless scope of his field, selects his material on the whole judiciously and presents it clearly.

Part One, "The Nature and Origin of Speech," covers familiar ground generally in the traditional fashion. The author believes (pp. 10, 20) that the oral word is an outgrowth of the gesture symbol (Paget); this idea perseverates (*e.g.* pp. 56, 69, 89) with increasing conviction on his part. The several theories presented as to the origin of speech, viewed scientifically, are without exception sheer *hypotheses ad hoc*, and their several authors seem unaware of the stupendous amount of rigorous scientific proof necessary to establish even small portions of them empirically.

Part Two, "Basic Psychological Aspects of Speech," commences with an admirably clear and concise description, with drawings, of the nervous mechanism, which is followed by a discussion of emotion in which a safe course is steered through general concepts, with available empirical data included. These discussions lead in turn to those of the psychology of learning, with particular emphasis on connectionist psychology, and of meaning, integration being made in most cases with the phenomena of speech production where the material admits. In the whole knotty problem of meaning, Eisenson's general attitude may be summarized in the healthy statement (p. 74): "If you wish to know all the possible meanings of a word, try to imagine all the possible ways of reacting to it. In how many ways can you react to the word *water*?" His closing discussion of speech and thought includes the (perhaps controversial) view of thinking as abridged talking—a view empirically supported by L. W. Max's excellent experiments on deaf-mutes—and is in general very well oriented, though here and there (*e.g.* p. 106, "Adults can remember . . .") are perhaps suggestions of spurious correlations.

With Part Three, "The Development of Speech and Language in the Child," the book becomes particularly readable, notably the portions on the disorders of speech in children (Chapter X). Part Four, "The Personality and Speech," brings together important material; and the discussion of the speech of the blind (pp. 158 ff.) and of the stutterer (pp. 165 ff.), and in general of the whole problem of perseveration in language is done with understanding. Part Five, "The Psychology of the Audience," discusses in considerable detail

the various problems of the crowd, including that of creating a psychological crowd (polarization), the demands of the crowd upon the speaker and of the speaker on the crowd, with the factors of attention, interest, suitable variegation, etc. kept well to the front. Rich in good counsel to the public speaker (even in the matter of stage fright, Chapter XVIII), the author is not so absorbed in general psychological topics to forget to add in closing (p. 266): "If you have no worth-while message you have no business appearing before an audience."

Limited space prevents more detailed description. In the opinion of the reviewer the book reveals both thought and skill. The frequent impression of insufficient integration may be ascribed in no small measure to the unhappy lack of integration in the material. Indeed, by bringing together broad problems and various viewpoints, integration may be ultimately helped. Though some essentials may seem to have been omitted (*e.g.* no unit of speech smaller than the word is considered), some omission is clearly inevitable in view of the complexity of the phenomenon. The author states in the Preface that his book is not intended to replace specialized treatises; he has been successful in avoiding the flavor both of any one "school" and of a too confusing eclecticism. The value of the book as a text will depend entirely upon the knowledge and resourcefulness of the instructor into whose hands it falls, for it frankly formulates problems as well as enumerates facts; and it wisely does not attempt to alleviate the reader's feeling that speech is by no means a simple process.

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NOTES AND NEWS

THE following new appointments have been made at the University of Southern California: Dr. Lee Edward Travis, professor of psychology; Dr. Milton Metfessel, research professor and chairman of the Division of Social Studies; Dr. Neil Warren, head of the department of psychology.

PROFESSOR MADISON BENTLEY, who has recently retired from the Sage Chair of Psychology at Cornell University, has been honored by his students and colleagues at Cornell and at the University of Illinois by a presentation of his portrait, done in oils by Olaf Brauner, together with a volume of memorial letters. Professor Bentley has lent the picture for an indefinite time to the department of psychology at Cornell, where it is to hang in the Great Hall of the Laboratory. After having spent the summer in California, Professor Bentley is now fulfilling his appointment as consultant for psychology and related subjects in the Library of Congress in Washington, D. C.

THREE professors have been appointed to the new department of neuropsychiatry which will conduct an intensive study of mental and nervous diseases in the hospitals and clinics affiliated with the Medical School of Washington University, St. Louis, Missouri. Dr. David M. Rioch, associate professor of anatomy at the Harvard Medical School, will become professor of neurology and administrative head of the department; Dr. John C. Whitehorn, director of the laboratories at McLean Hospital, Boston, will be professor of psychiatry; and Dr. Carlyle F. Jacobsen, assistant professor of psychology at the Cornell University Medical School and psychiatrist in the Payne Whitney Clinic, will be professor of medical psychology.—*Science*.

THE University of Nebraska at its sixty-seventh annual commencement conferred the doctorate of laws on Dr. Harry Levi Hollingworth, professor of psychology in Barnard College, Columbia University, and on Dr. Leta Stetter Hollingworth, professor of educational psychology, Teachers College, Columbia University.

—*Science*.

DR. HAROLD V. GASKILL, professor of psychology and assistant dean of the Division of Industrial Science at the Iowa State College, has been appointed dean of the division.—*Science*.

THE honorary degree of doctor of science was conferred by the University of Oxford on July 30 on Dr. Charles Gustave Jung, professor of psychology at Zurich.—*Science*.

THE Illinois Society of Consulting Psychologists, now in its third year of existence, recently elected the following officers for the year 1938-1939: *President*, Dr. Arthur W. Kornhauser, University of Chicago; *Vice-president*, Dr. Andrew W. Brown, Institute for Juvenile Research, Chicago; and *Secretary-Treasurer*, Dr. Helen L. Koch, University of Chicago.—*Science*.

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